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AUTHORITY				
AFRPL ltr, 15 May 1986				



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SIMULATED AIR LAUNCH ENVIRONMENT

FINAL REPORT FOR PERIOD SEPT. 72 THROUGH MAY 74

O. R. PRITTS, ET AL

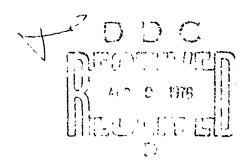
THIOKOL CORPORATION
HUNTSVILLE DIVISION
HUNTSVILLE, ALABAMA 35807

OCTOBER 1974

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VOLUME II: AEROHEAT DATA SUMMARY



AIR FORCE ROCKET PROPULSION LABORATORY DIRECTOR OF SCIENCE AND SECHNOLOGY AIR FORCE SYSTEMS COMMAND EDWARDS, CALIFORNIA 93523

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FOREWORD

This program was sponsored by AFRPL. Dr. J. L. Trout, AFRPL/MKPB, was the Program Monitor. Mr. G. F. Mangum was Project Director and Mr. D. B. Turner was Program Manager for the Thiokol Corporation. Mr. O. R. Pritts was Principal Investigator. Significant contributions were made by Mr. J. M. Nelson in Stress Analysis and Physical Properties Testing, Mr. G. A. Collingwood in Stress Analysis, and Mr. J. D. Marlin, III who acted as Test Engineer. The contract was performed over the period September 1972 to May 1974.

This report has been read and is approved.

Salid-Rocket Division

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered) READ INSTRUCTIONS REPORT DOCUMENTATION PAGE 2. GOVT ACCESSION NO. 3 RECIPIENT'S CA FINALEREPORT Simulated Sept 72 - May 1 Air Launch Environment, Volume II. Aeroheat Data Summary. O. R. Pritts setal-FØ4611-73-C-0015 NIZATION NAME AND ADDRESS Thiokol/Redstone Division BPSN-62302F-Redstone Arsenal Project - 3417 Huntsville, Alabama 3580 CONTROLLING OFFICE NAME AND ADDRESS 35807 Air Force Rocket Propulsion Laboratory/AFSC BER OF PAGES Volume I-Edwards, California 93523 280; Valume II - 315 14. MONITORING AGENCY NAME & ADDRESSIL different from Controlling Office) 15 SECURITY CLAS Unclassified AF-341 16 DISTRIBUTION STATEMENT (of the Report) Distribution limited to U. S. Gov't agencies only; Test and Evaluation 12 September 1974. Other requests for this document must be referred to AFRPL(STINFO/DOZ), Edwards, CA 93523 DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Coron) Approved for Public Release: Distribution Unlimited 1976 18 SUPPLEMENTARY NOTES 19 KEY WORDS (Continue on reverse side if necessary and identify by block number) Air Launch Environment, Aeroheat Analysis, THVINC, Uninstrumented Motor Test, Instrumented Motor Test, Gage Calibration, Failure Criteria, Propellant Characteristick * Temperature ARSTRACT (Continue on reverse side if necessary and identify by block number) A program was conducted in which the respons ϵ and failure characteristics of solid propellant rocket motors when subjected to transient thermal conditions representing air launch operational environments were recorded and analyzed. Future Air Force mission profiles were used. The Maverick motor, AGM-65A, was used as a test bed on the program. DD 1 JAN 73 1473 EDITION OF \$ NOV 65 IS OBSOLETE

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Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Date Entered)

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INTRODUCTION

This volume contains the data summary of the tests conducted on the three instrumented SALE motors. The volume is divided into three separate sections: Section A, IM #2 Data Summary; Section B, IM #3 Data Summary; and Section C, IM #1 Data Summary. A test summary, a motor drawing showing the location of the gages, and data from the tests conducted on the instrumented motor are presented in each section for the three respective motors.

SECTION A

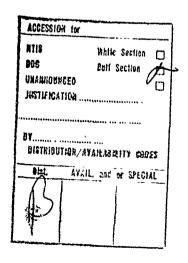
SALE IM #2 DATA SUMMARY

CONTENTS

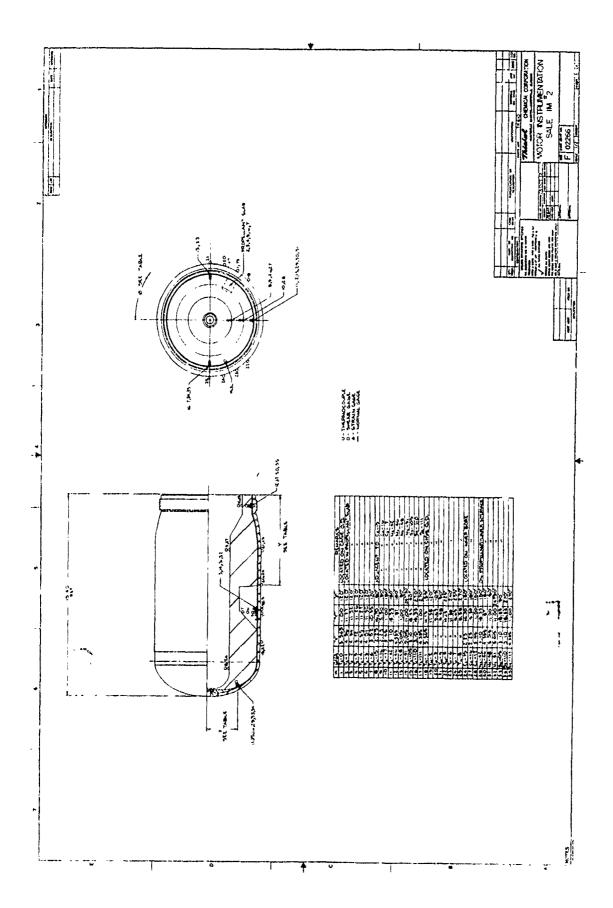
Motor Drawing Test History

Temperature Profile Histories - Tests One through Six
Head End Normal Stress Response - Tests One through Six
Mid Motor Normal Stress Response - Tests One through Six
Aft Motor Normal Stress Response - Tests One through Six
Head End Stress Response (Shear Gages) - Tests One through Six
Aft End Shear Stress Response (Shear Gages) - Tests One through
Six

Bore Strain Results (Clip Gages) - Tests One through Six



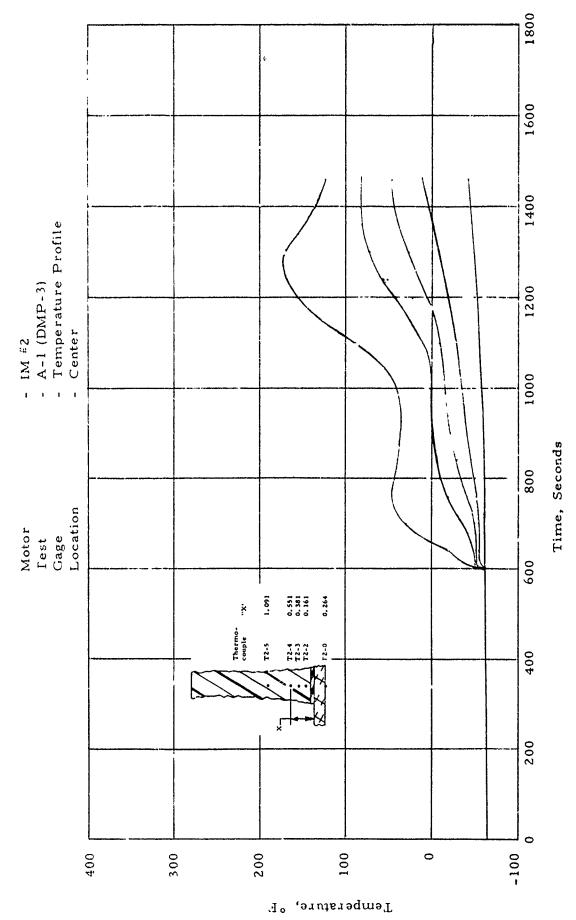




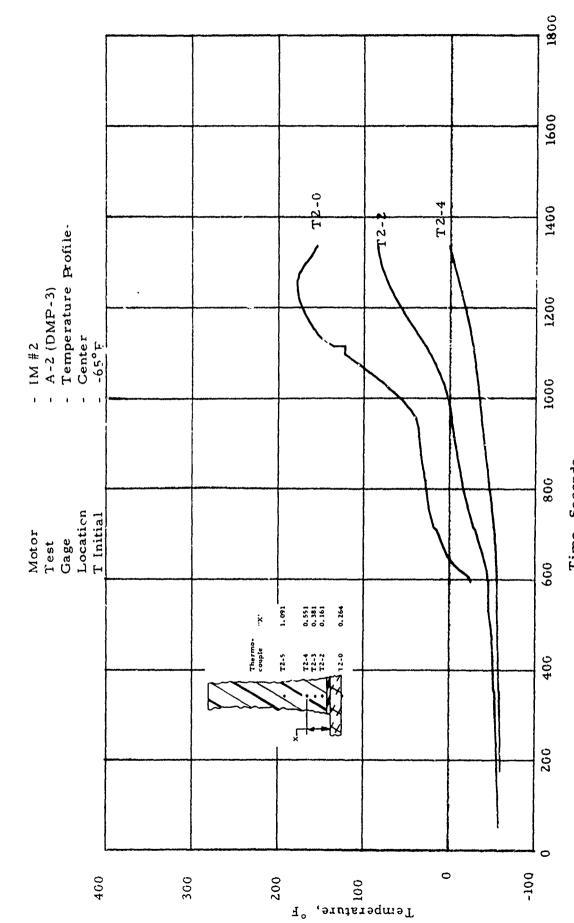
TEST HISTORY OF IM #2

Test No.	Date	Aeroheat Mission	Initial Motor Temperature, ^o F
A-1	73 Aug 03	DMP-3	-65
A-2	73 Aug 06	DMP-3	-65
A-3	73 Aug 07	SFPI	- 65
A-4	73 Aug 08	SFPI	- 65
A-5	73 Aug 09	HSMH	-65
A-6	73 Aug 10	HSMH	-65
A-7	73 Aug 22	HSMH	80
A-8	73 Aug 24	HSMH	140
A-9	73 Aug 27	HSMH	0
A-10	73 Aug 28	SFPI	-40
A-11	73 Aug 29	SFPI	80
A-12	73 Aug 30	SFPI	-65
A-13	73 Aug 31	SFPI	80 →40*
A-14	73 Sep 04	SFPI	80 →-40*
A-15	73 Sep 05	SFPI	140 → -40
A-16	73 Sep 06	SFPI	140 →-40
A-17	73 Sep 07	SFPI	- 65
A-18	73 Sep 19	SFPI	- 65
A-19	73 Sep 20	SFPI	- 65
A-20	73 Oct 08	DMP-3	- 65
A-21	73 Oct 10	HSMH	- 65

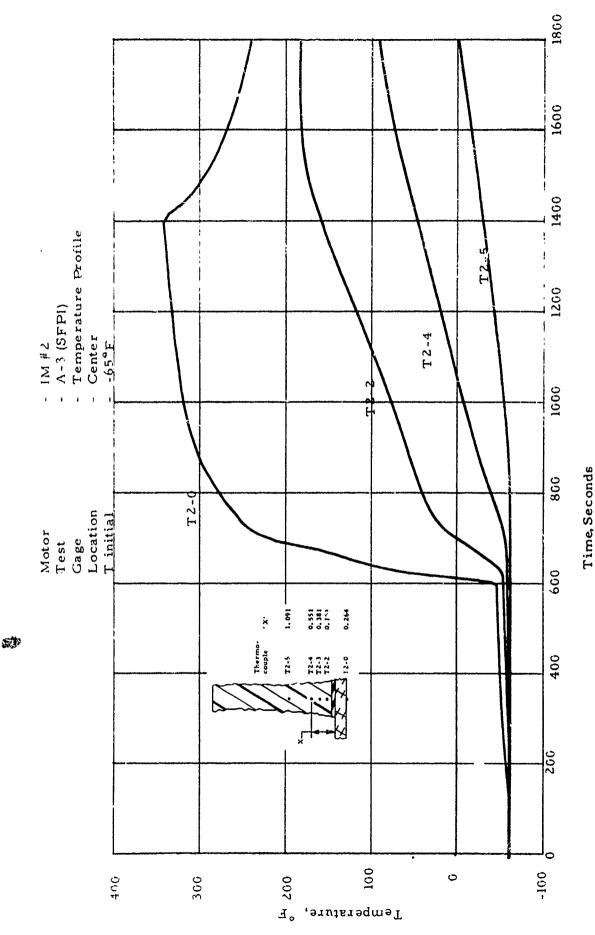
Motor equilibrated at 80°F, then rapidly cooled to case wall temperature of -40°F before aeroheating.



Temperature Profile Histories for Various Aerohead Loads. Test A-1

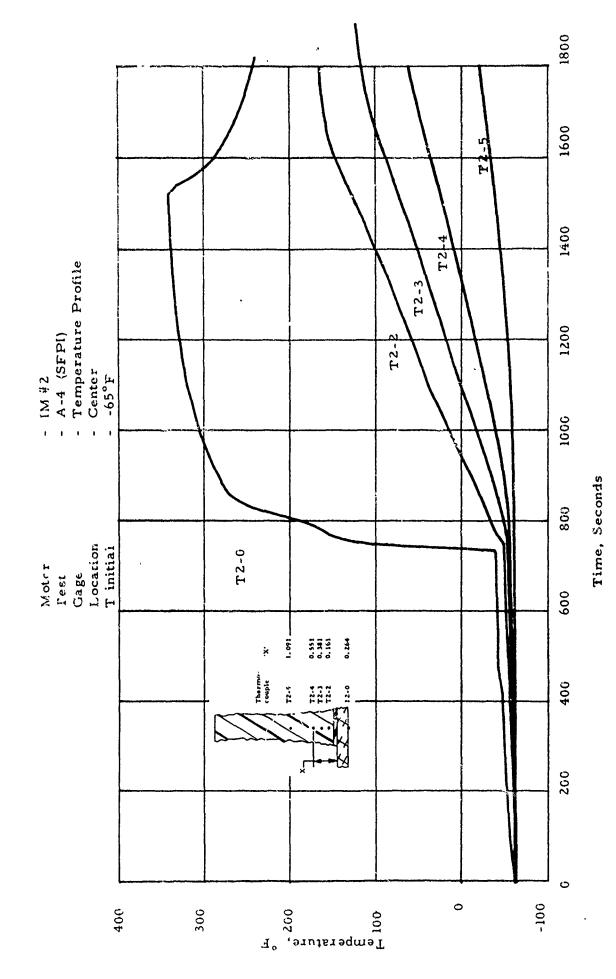


Temperature Profile Histories for Various Aeroheat Loads. Test A-2 Time, Seconds

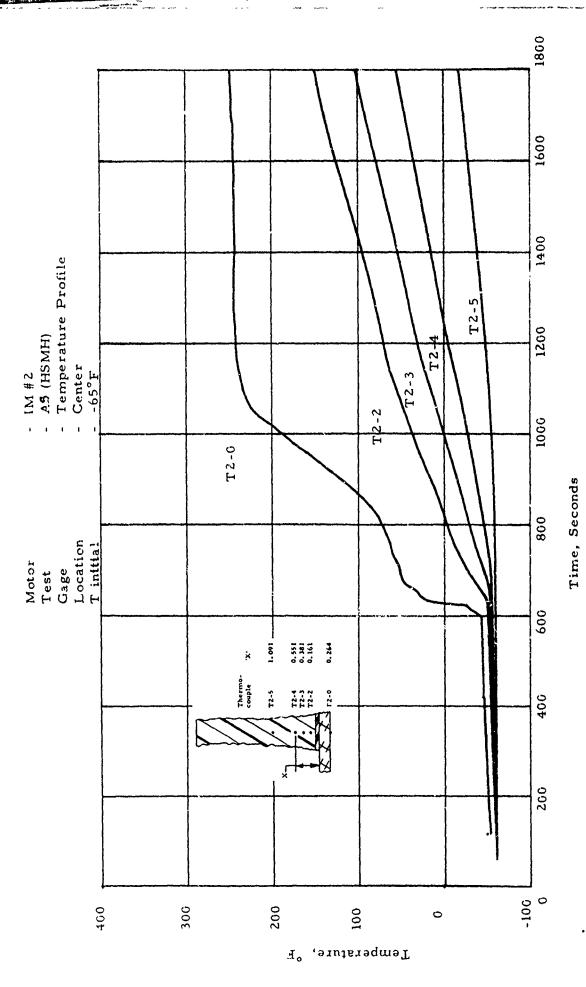


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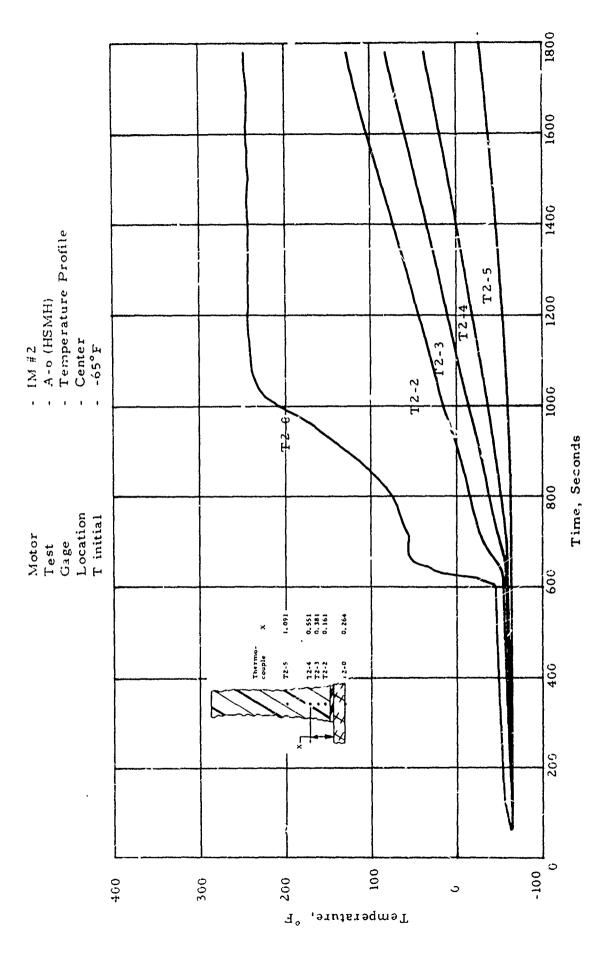
Temperature Profile Histories for Various Aeroheat Loads. Test A-3



Temperature Profile Histories for Various Aeroheat Loads. Test A-4



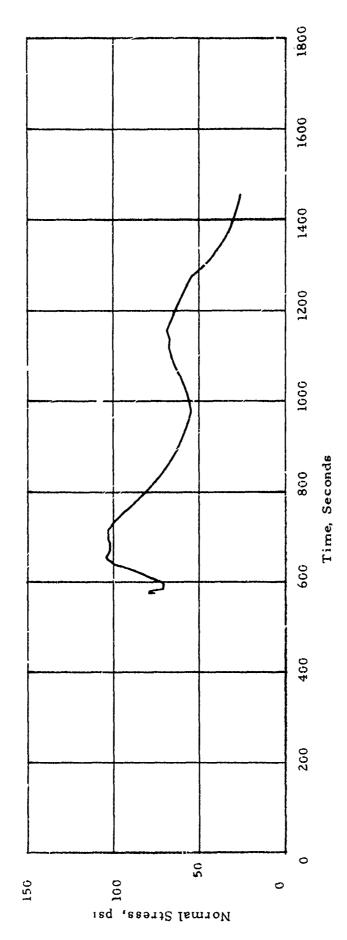
Temperature Profile Hastories for Various Aeroheat Loads. Test A-5



Temperature Profile Hatories for Various AeroheatLoads. Test A-6



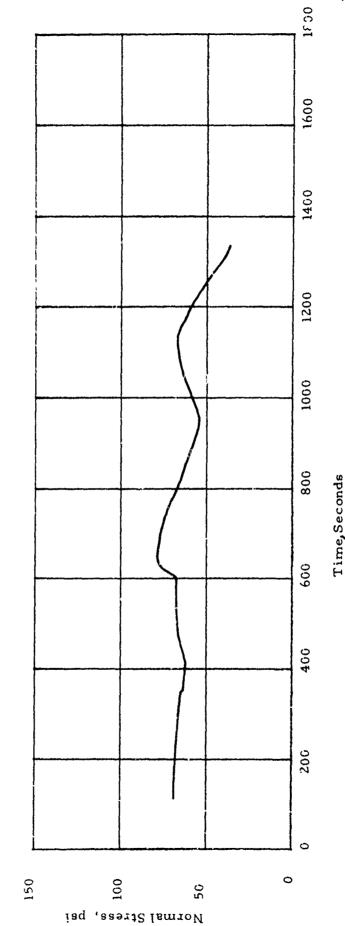
Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $\mathbb{R}^n \cdot \mathbb{R}^n$



Gage N2-42 Test A-i Head end Normal Stress Response to Aeroheat Loads.



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170° Jr



Headad: J Normal Stress Response to Aero heat Loads. Gage N2-42 Test A-2 (DMP-3)

 Motor
 - IM # 2

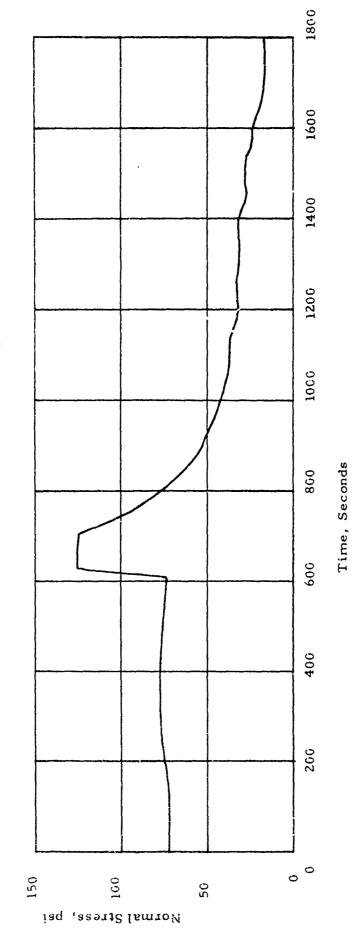
 Test
 - A-3 (SFPI)

 Gage
 - N2-42

 Location
 - Fwd

 T initial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Headend Normal Stress Response to Aeroheat loads. Gage N2-42 Test -A-3

Motor - IM #2

Test - A-4 (SFPI)

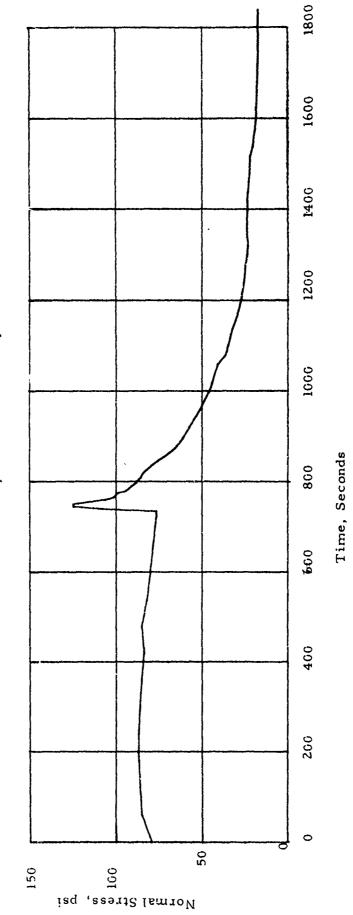
Gage - N2-42

Location - Fwd

T initial - -65°F

100

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,^{\circ}F$



Headend Normal Stress Response to Aeroheat Loads. Gage N2-42 Test A-4

 Motor
 - IM #2

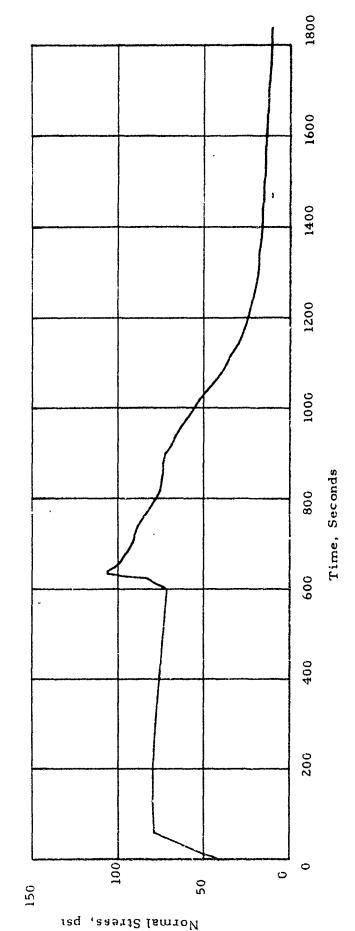
 Test
 - A-5 (HSMH)

 Gage
 - N2-42

 Location
 - Fwd

 T initial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F

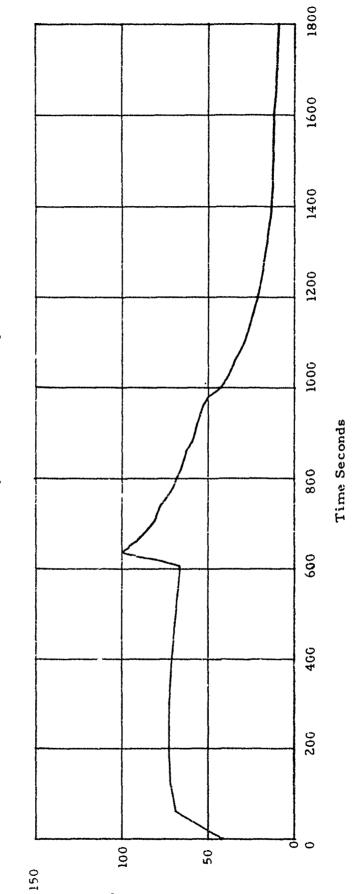


Headend Normal Response to Aeroheat Loads. Gage N2-42 Test A-5



The state of the second of the

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$



Headend Normal Biress Response to Aeroheat Loads. Gage N2-42 Test A-6

Normal Stress, psi

Motor - 1M #2

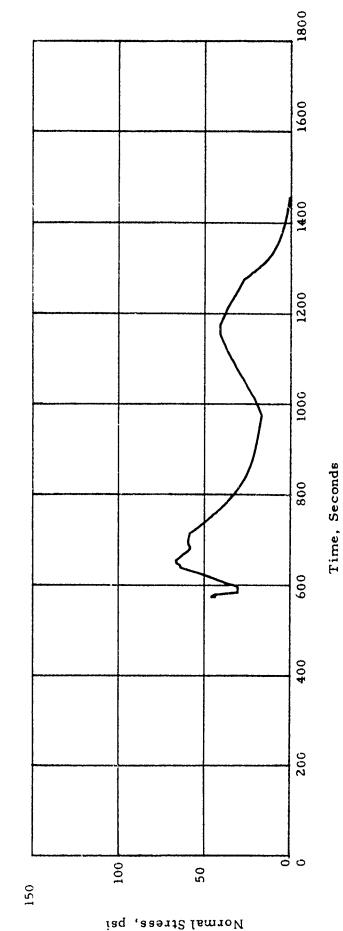
Test - A-1 (DMP-3)

Gage - N2-51

Location - Center

T initial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F

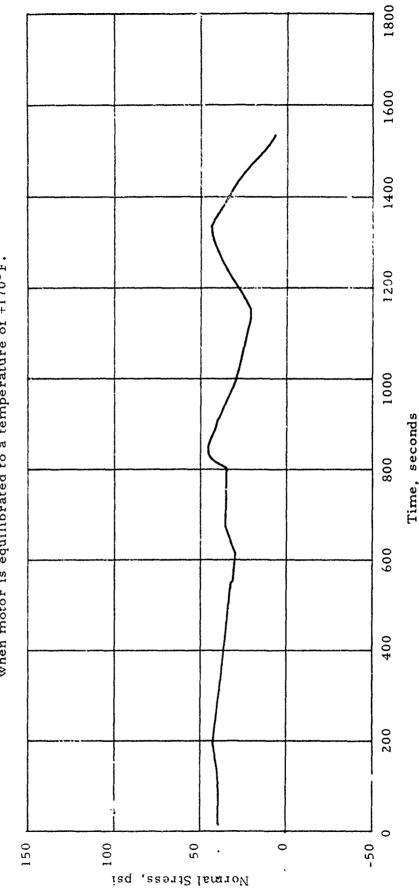


Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-51 Test A-1

Motor - IM #2 Test - A-2 (DMP-3) Gage - N2-51 Location - Fwd Tinitial - -65°F

The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm O} F$.



Test A-2 Head End Normal Stress Response to Aeroheat Loads - Gage N2-51

Motor - IM #2

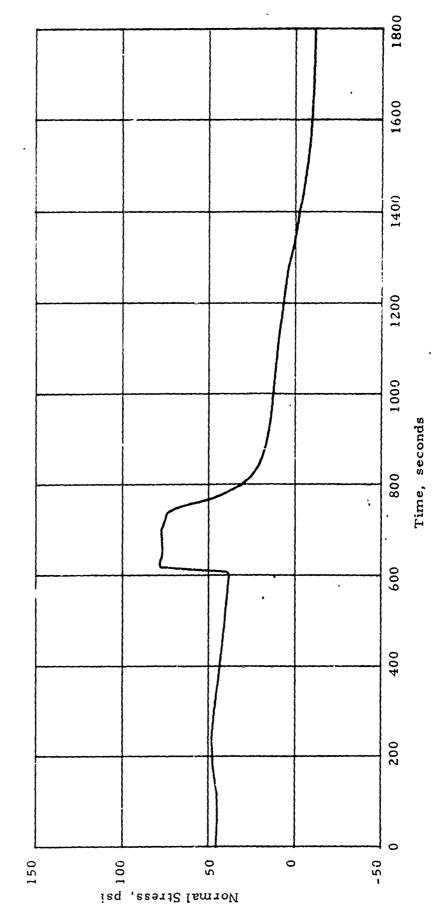
Test - A-3 (SFPI)

Gage - N2-51

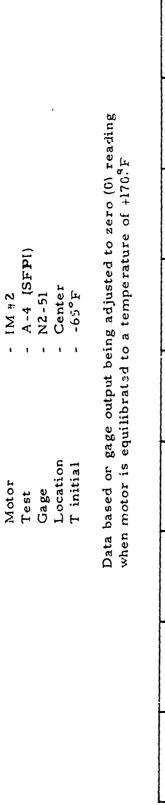
Location - Fwd

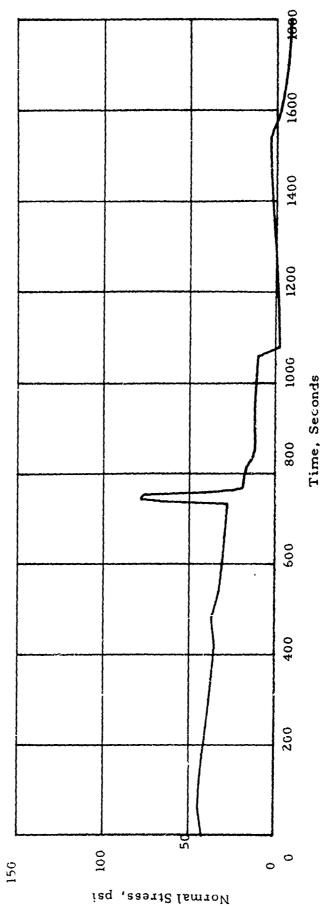
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a teriperature of $+170^{\circ}$ F.



Head End Normal Stress Response to Aeroheat Loads - Gage N2-51 Test A-3





 Motor
 - IM #2

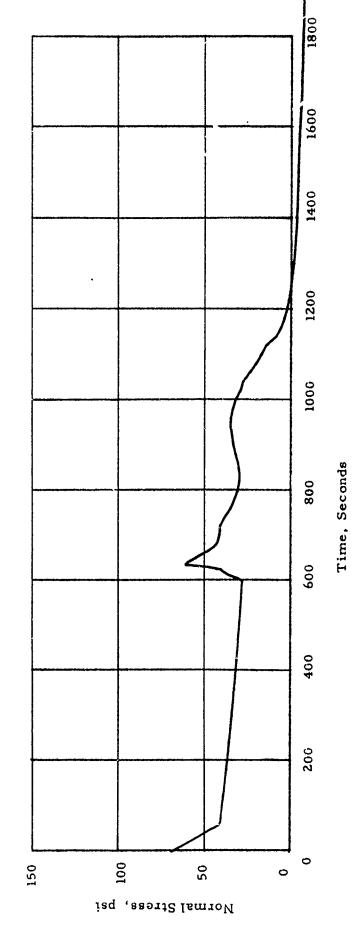
 Test
 - A-5 (HSMF)

 Gage
 - N2-51

 Location
 - Center

 T initial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}$ F



Test A-5 Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-51.

 Motor
 - IM # 2

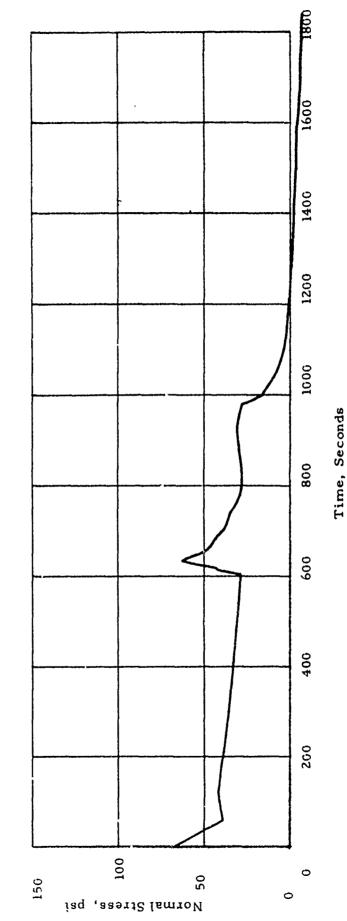
 Test
 - A-6 (HSMH)

 Gage
 - N2-51

 Location
 - Center

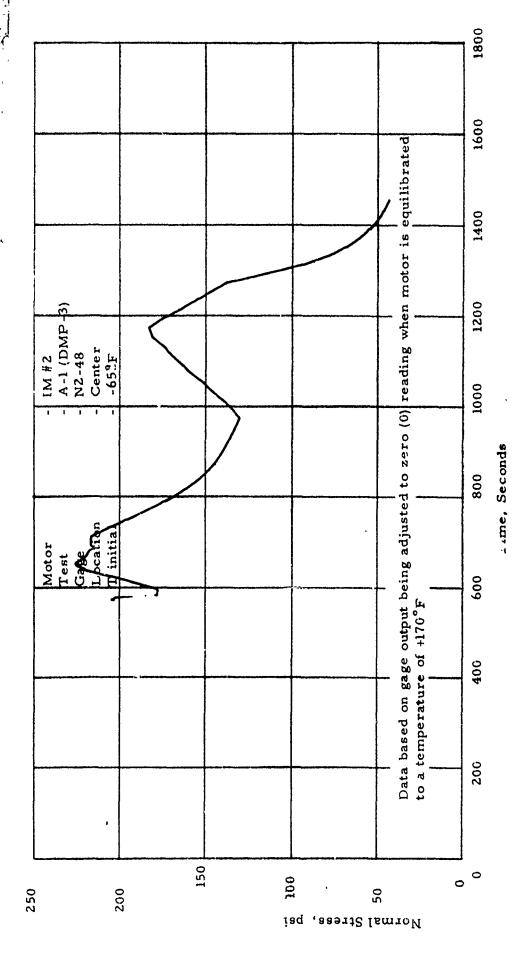
 T initial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-51 . Test A-6

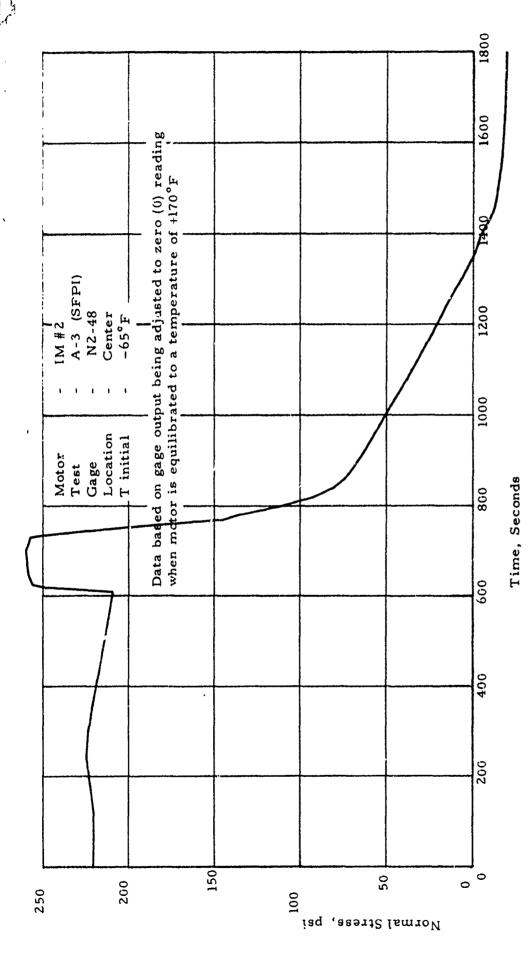
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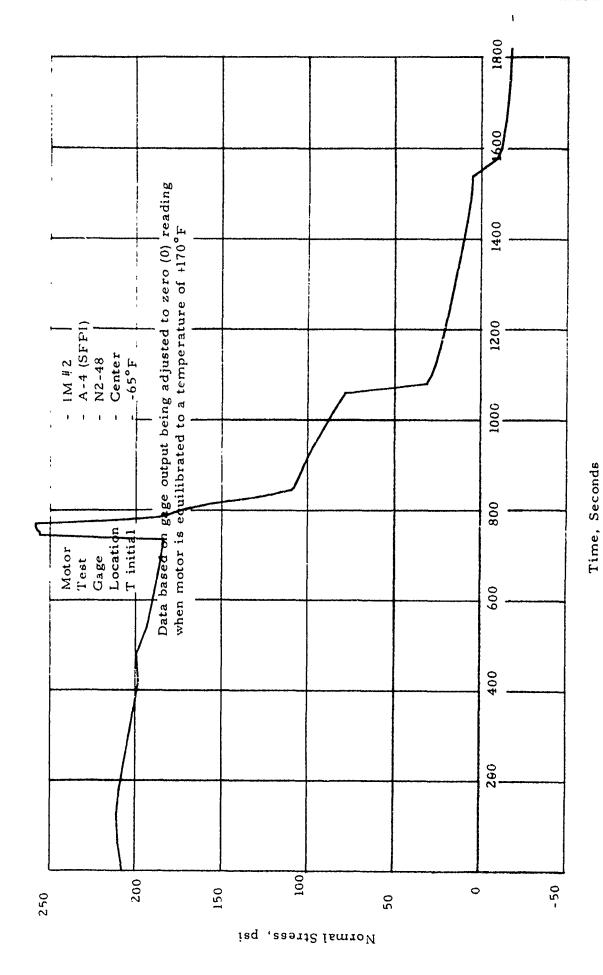
Mid Mctor Normal Stress Response to Aeroheat Loads. Gage N2-48 Test A-1

Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-48 Test A-2

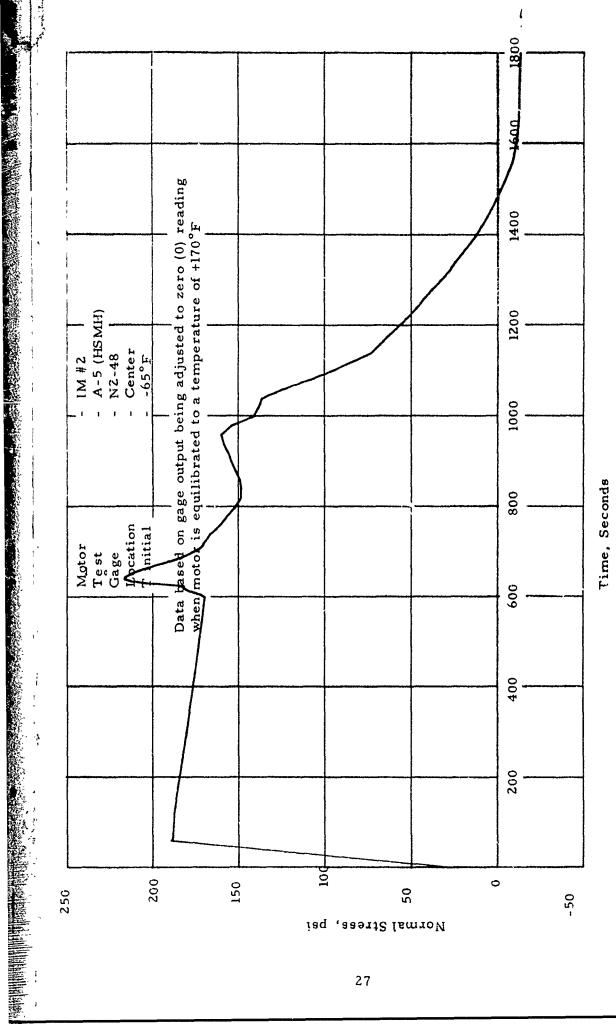
Time, Seconds



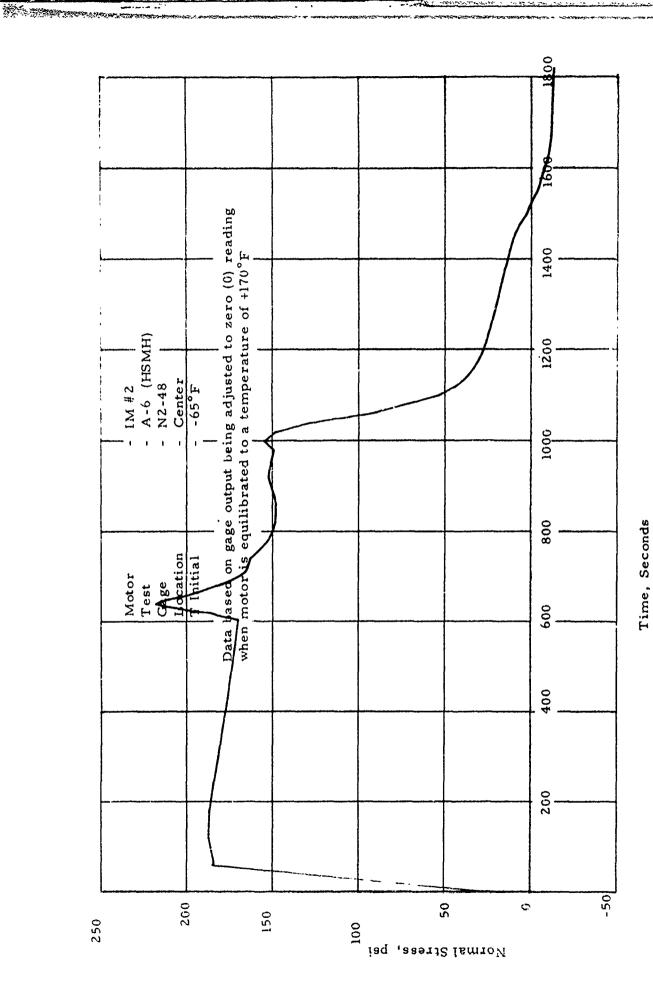
Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-48 A-3



Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-48 Test A-4



Mid Motor Normal Stress Response to Aeroheat Loads. Gage N2-48 Test A-5

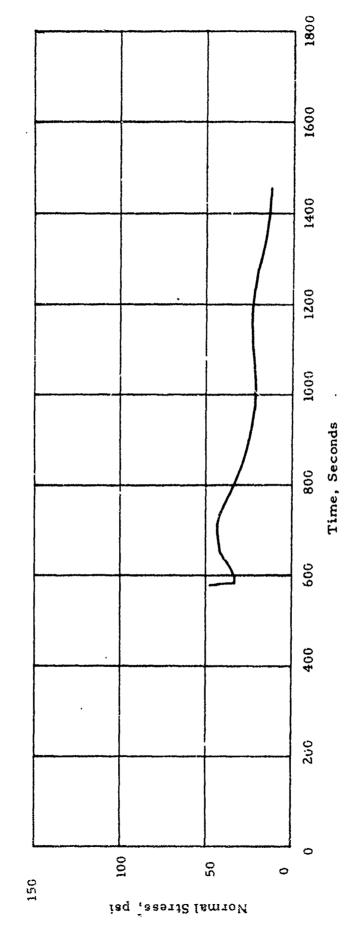


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S ٠ζ Test Mid Motor Normal Stress Response to Aeroheat Loads. Grge N2-48

IM #2	A-1 (DMP-3)	N2-46	Aft	-65°F
4		ı	1	•
Motor	Test	Gage	Location	T initial

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Aft Motor Norma! Stress Response to Aeroheat Loads. Gage N2-46 Test A-1 /

Motor - 1M #2

Test - A-2 (DMP-3)

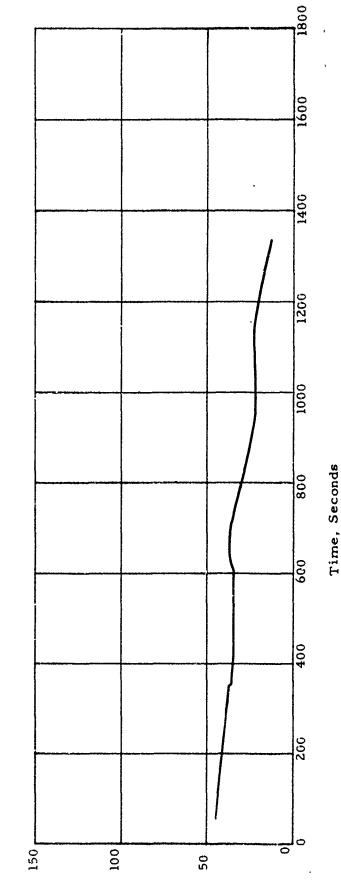
Gage - N2-46

Location - Aft

T initial - -65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Aft Motor Normal Stress Response to Aeroheat Loads. Gage N2-46

Test A-2

Normal Stress, Psi

Motor - IM #2

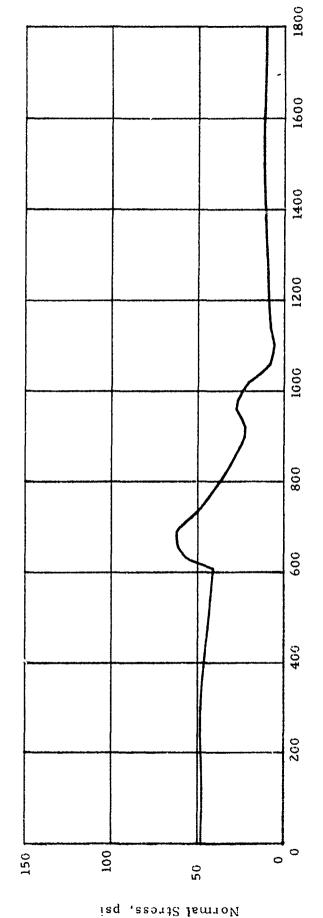
Test - A-3 (SFPI)

Gage - N2-46

Location - Aft

T initial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Time, Seconds

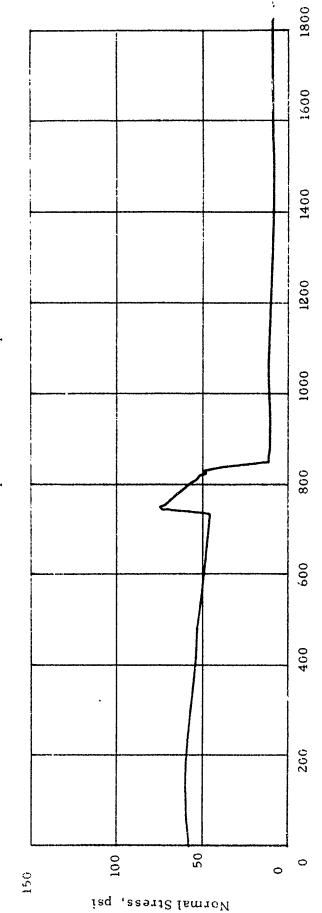
Gage- N2-46 Test A-3 Aft Motor Normal Stress Response to Aeroheat Loads.



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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Time, Seconds

Aft Motor Normal Stress Response to Aeroheat Loads. Gage N2-46 Test A-4

 Motor
 - IM = 2

 Test
 - A-5 (HSMH)

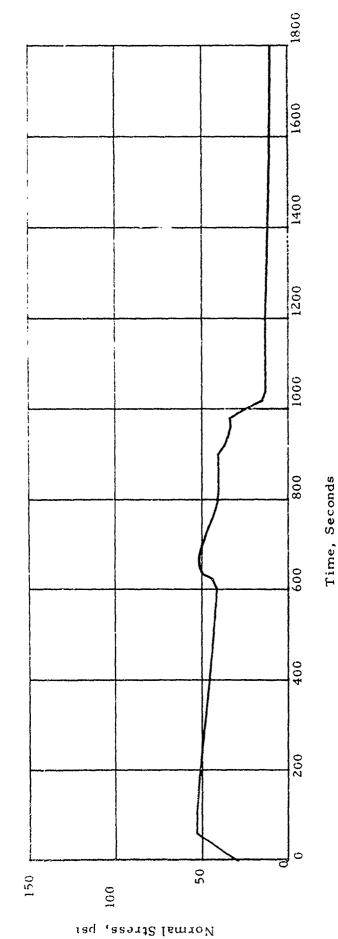
 Gage
 - N2-46

 Location
 - Aft

 T initial
 - -65°F

1

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Aft Motor Normal Stress Response to Aeroheat Loads. Gage N2-46 Test A-5

Motor - 1M # 2

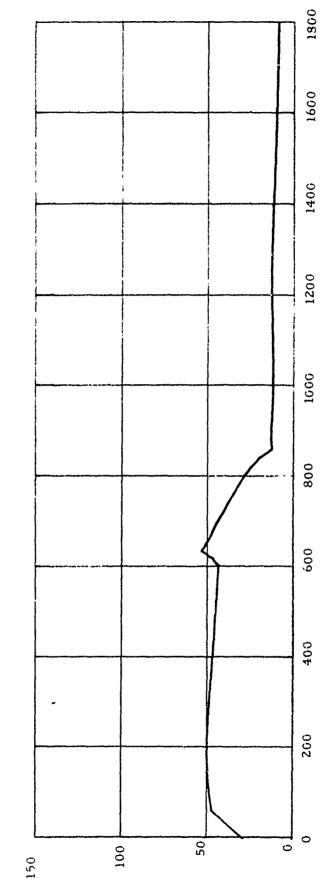
Test - A - 6 (HSMH)

Gage - N2 - 46

Location - Aft

T initial - - 65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Aft Motor Normal Stress Response to Aeroheat Loads. Gage N2-46 Test A-6

Time, Seconds

Normal Strees, pei

Motor - [M = 2

Test - A-1 (DMP-3)

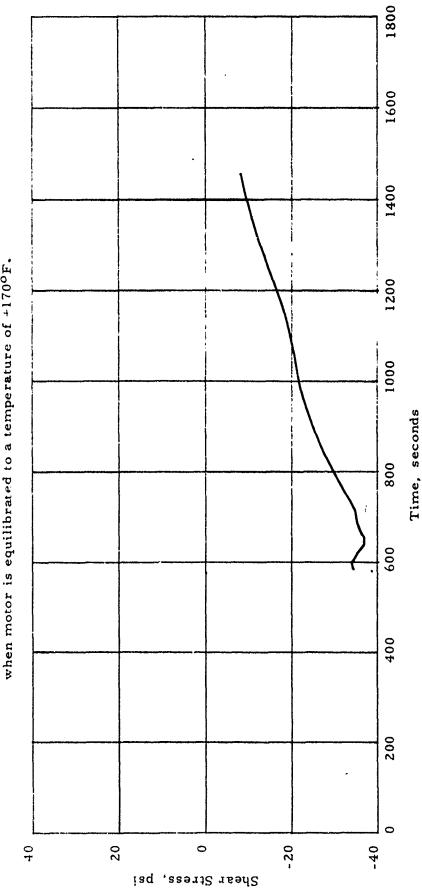
Gage . S2-105

Location - Fwd

Tinitial - -650F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm O} F_{\bullet}$

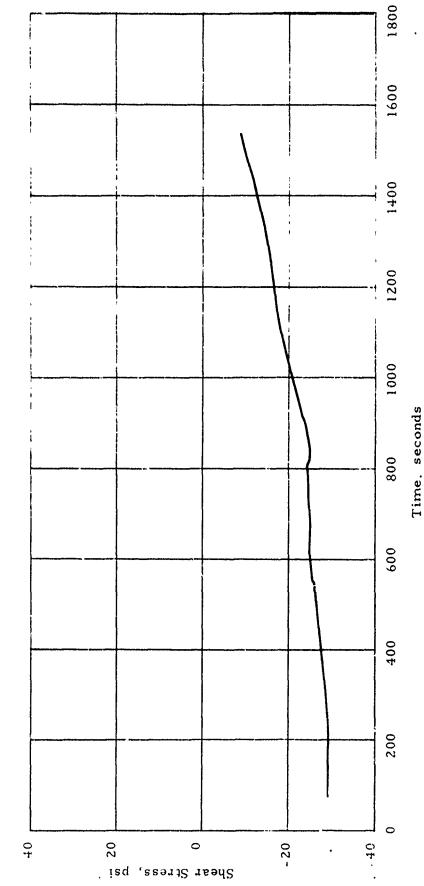


Head End Shear Stress Response to Aeroheat Loads -- Gage S2-105

Motor - :M 2
Test - A-2 (DMP-3)
Gage - S2 105
Location - Fwd
Tinitial - -65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $^{\pm}170^{\rm o}F_{\bullet}$



Head End Shear Stress Response to Aeroheat Loads -- Gage S2-105

Motor - IM = 2

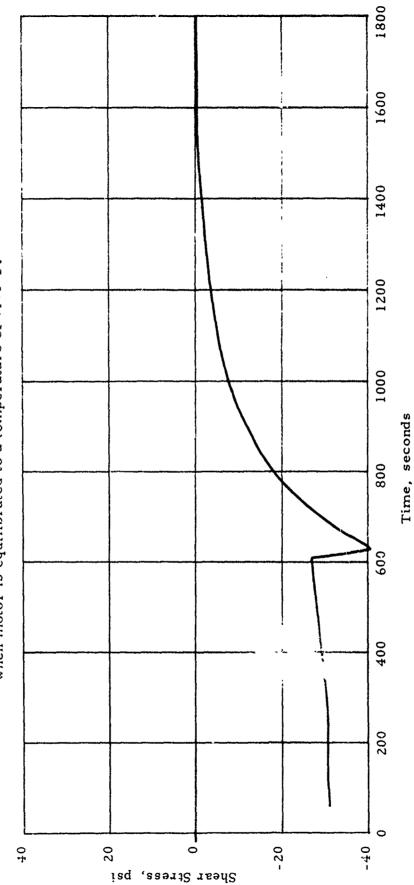
Test - A-3 (SFPI)

Gage - S2-105

Location - Fwd

Tinitial - -65°F

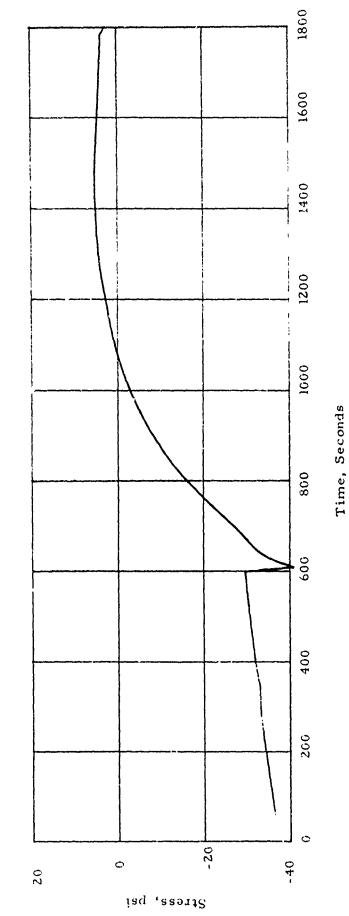
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm o}F_{\bullet}$



Head End Shear Stress Response to Aeroheat Loads -- Gage S2-105



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $-170^{\circ}\mathrm{F}$



Head End Stress Response to Aeroheat Loads, Gage S2-105 A-4

Motor - 1M # 2

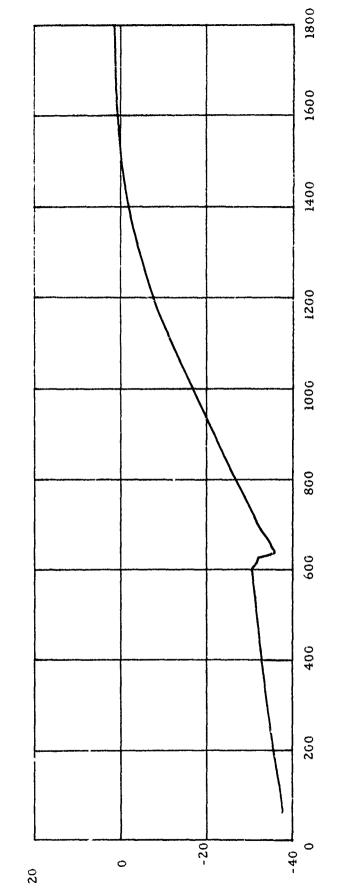
Test - A - 5 (HSMH)

Gage - S2 - 10 5

Location = F wd

T initial - - 65° F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$



Gage S2-105 Test A-5 Head End Stress Response to Aeroheat Loads

Time, Seconds

Stress, psi

Motor - IM #2

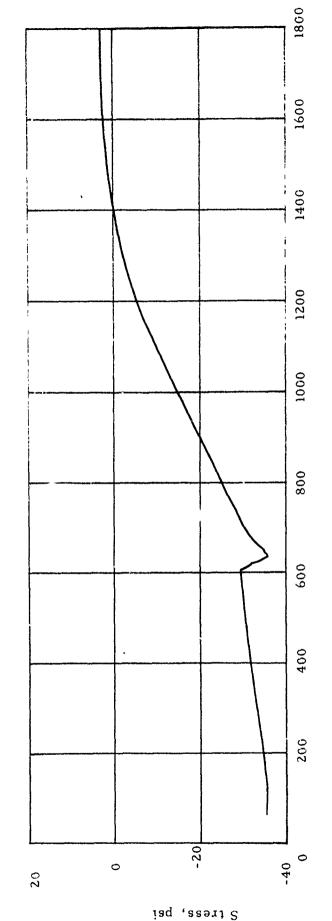
Test - A-6 (HSMH)

Gage - S2-105

Location - Fwd

T initial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$



Time, Seconds

Head End Stress Response to Aeroheat Loads. Gage S2-105 Test A-6

Motor - IM = 2

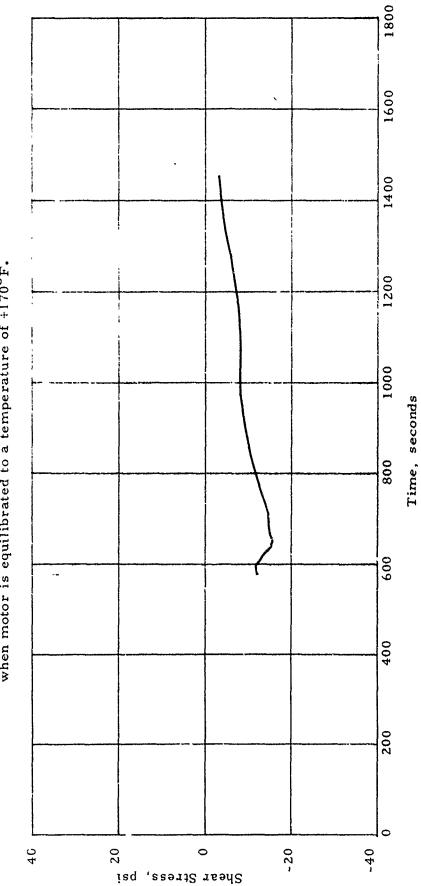
Test - A-1 (DMP-3)

Gage - S2-110

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$.



Head End Shear Stress Response to Aeroheat Loads - Gage S2-110

Motor - IM #2

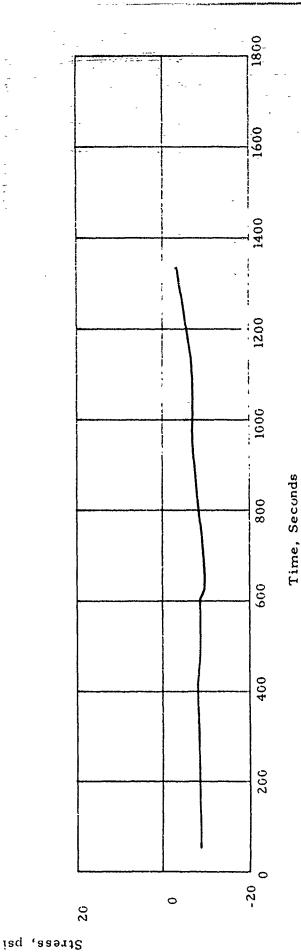
Test - A-2 (DMP-3)

Gage - S2-116

Location - F-wd

T initial - -65°F

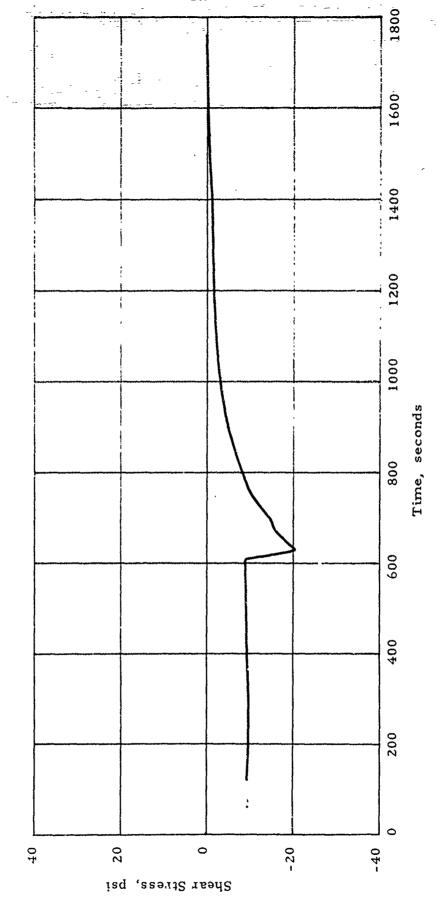
Data based on gage output being adjusted to zero (G) reading when motor is equilibrated to a temperature of $\pm170\,^{\circ}\mathrm{F}$



Head End Stress Response to Aeroheat Loads. Sage S2-110 Test A-2

Motor - IM #2
Test - A-3 (SFPI)
Gage - S2-110
Location - Fwd
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm O} {\rm F}$.

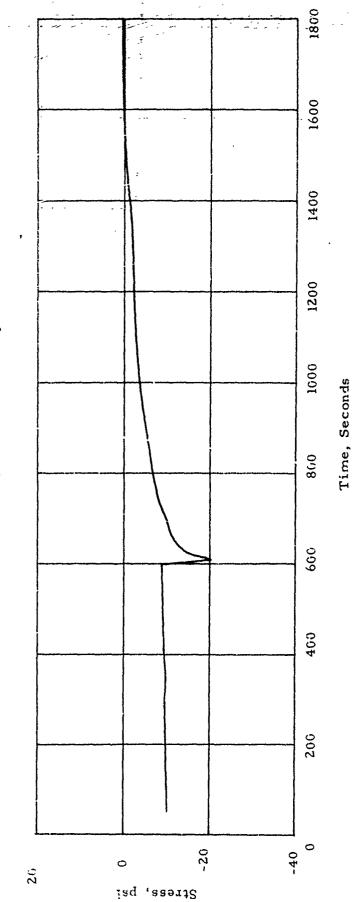


Head End Shear Stress Response to Aeroheat Loads - Gage S2-110



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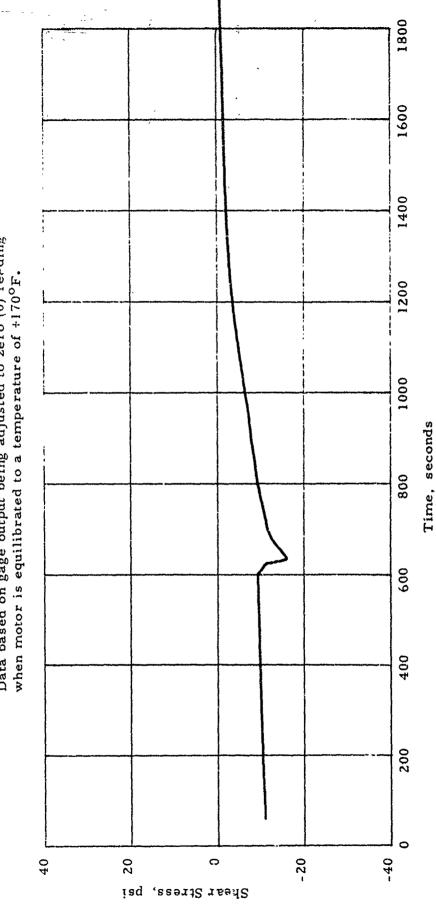
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$



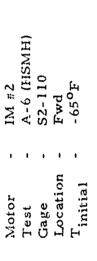
Head End Stress Response to Aeroheat Loads. Gage S2-110 Test A-3

IM #2 11-5 (HSMH) S2-110 Fwd -65°F Gage Location Tinitial Motor Test

Data based on gage output being adjusted to zero (0) reading

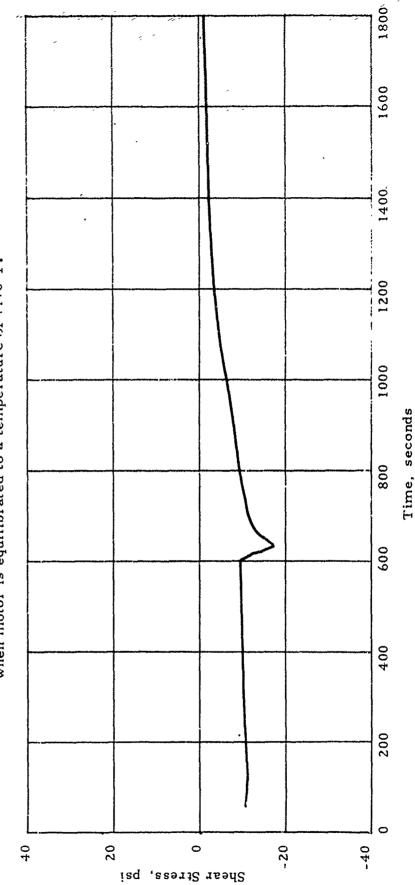


Head End Shear Stress Response to Aeroheat Loads - Gage S2-110



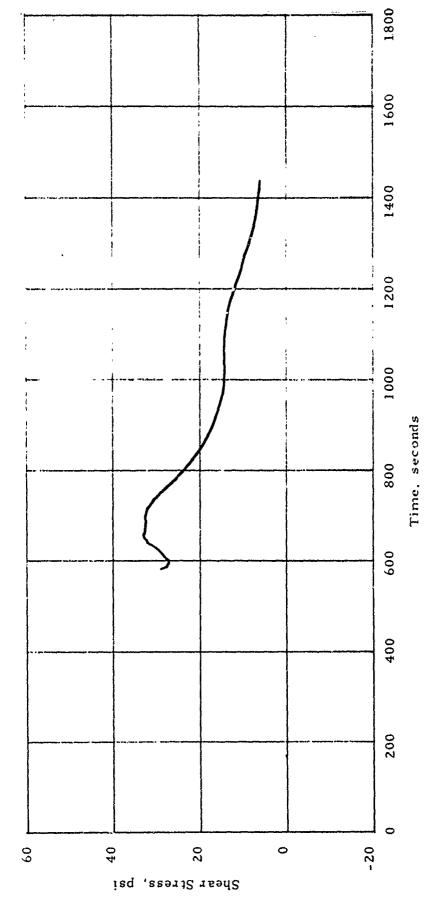
A MARINE STATE OF THE STATE OF

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm o} {\rm F}_{\star}$

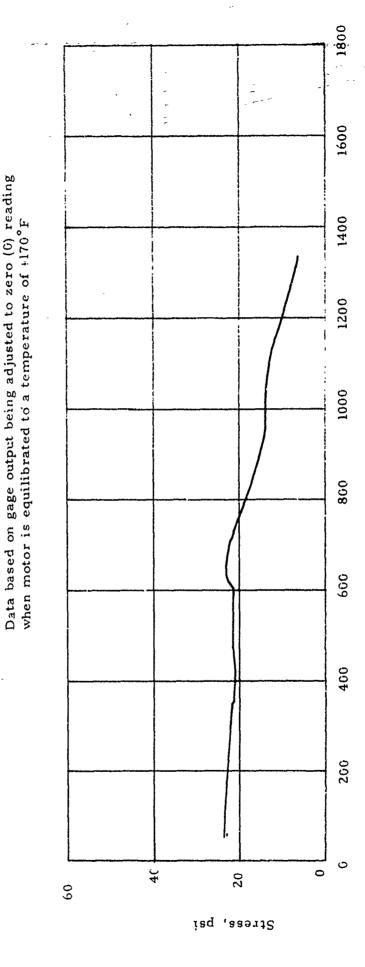


Head End Shear Stress Response to Aeroheat Loads - Gage S2-110

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Aft End Shear Stress Response to Aeroheat Loads . Gage S2-111



A-2 (DMP-3)

\$2-111 Aft

> Location T initial

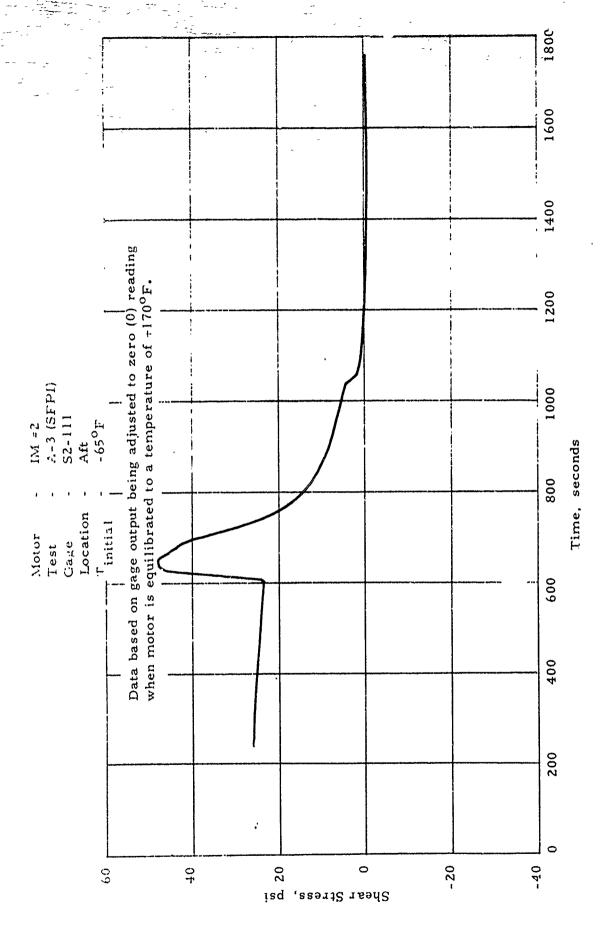
Test Gage

1M # 2

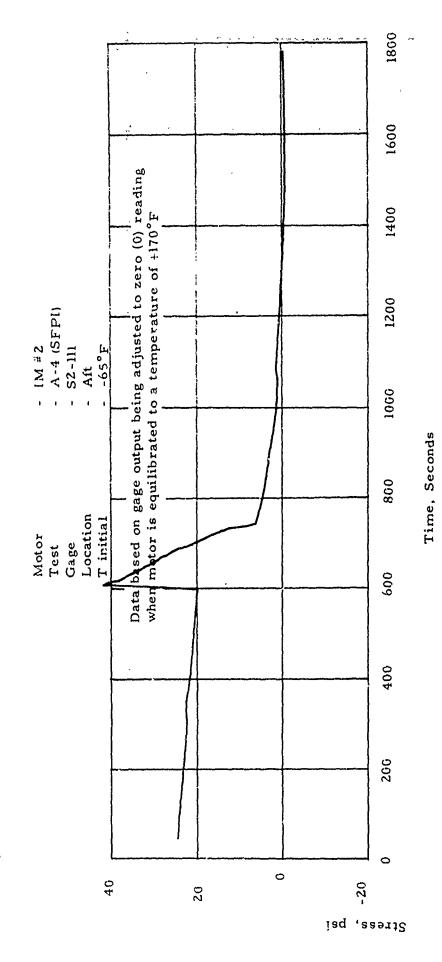
Motor

Test A-2 Aft End Shear Stress Response to Aeroheat Loads. Gage S2-III

Time, Seconds



Aft End Shear Stress Response to Aeroheat Inads - Gage S2-111



50

Aft End Shear Stress Response to Aeroheat Leads. Gage S2-111 Test A-4

Motor - IM : 2

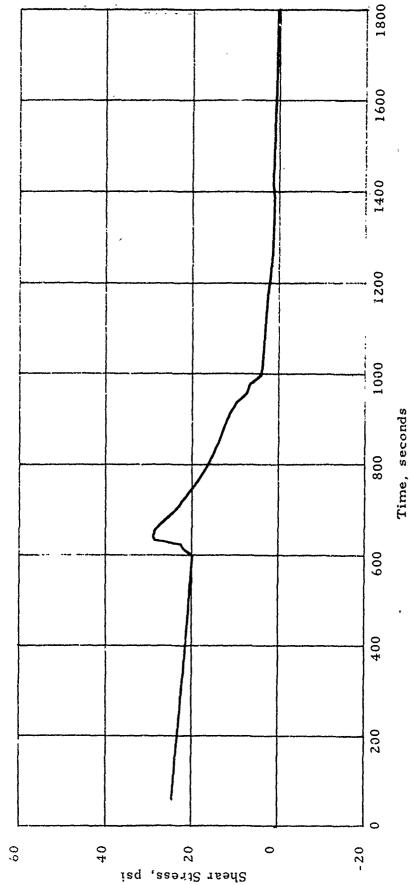
Test - A-5 (HSMH)

Gage : S2-111

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm O} {\rm F}_{\bullet}$.



Aft End Shear Stress Response to Aeroheat Loads - Gage S2-111

Motor - IM - 2

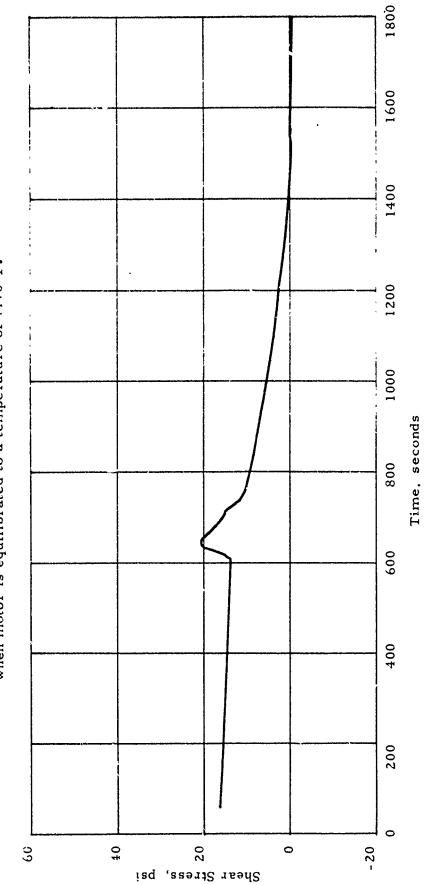
Test - A-6 (HSMH)

Gage - S2-111

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\rm C}$ F.



Aft End Shear Stress Response to Aeroheat Loads - Gage S2-111

The second second

Motor - IM #2

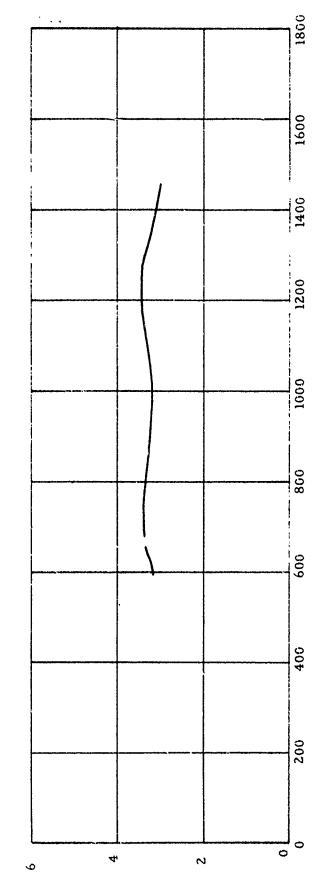
Test - A-1 (DMF-3)

Gage - C2-15

Location - Fwd

T initial - -65°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of +176°F



Time, Seconds

Bere Strain Results to Aeroheat Loads. Gage C2-15 Test A-1

Strain,

Motor - IM #2

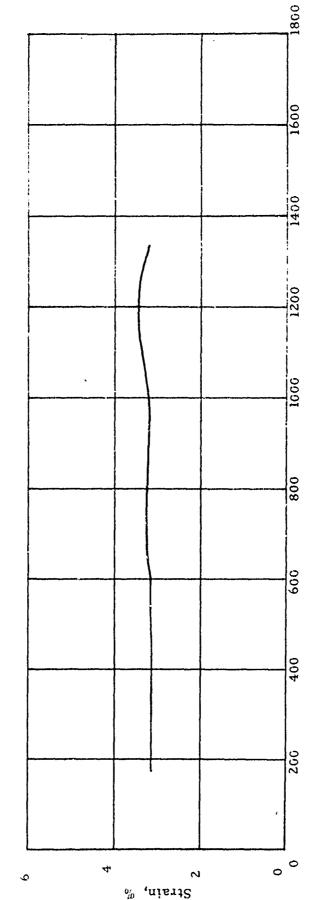
Test - A-2 (DMP-3)

Gage - C2-15

Location - Fwd

T initial - -65°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of +170°F

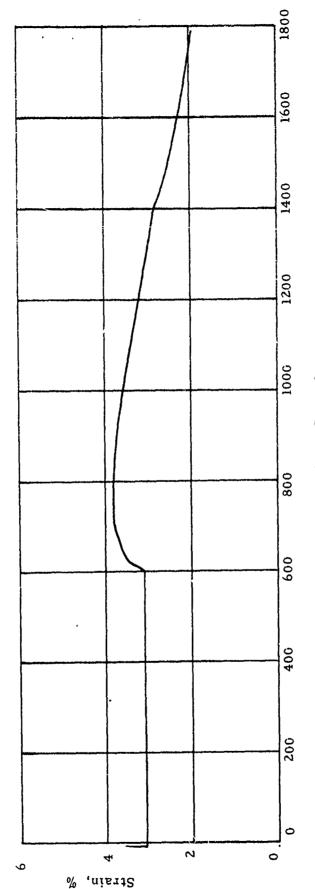


Time, Seconds

Bore Strain Results to Aeroheat Loads. Gage C2-15 Test A-2

IM #2	A-3 (SFPI)	C2-15	Fwd	-65°F
ı	•	ı	ı	ŀ
Motor	Fest	Jage	Cocation	F initial

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$

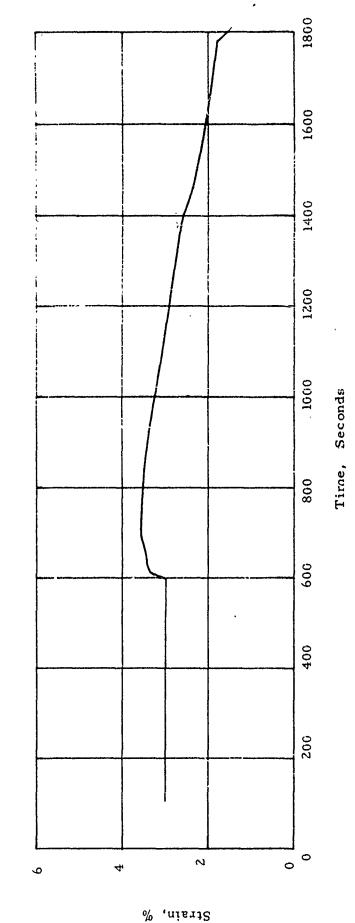


Time, Seconds

Bore Strain Results to Aerohea Loads. Gage C2-15 Test A-3

1M #2	A-4 (SFPI)	C2-15	Fwd	-65°F
ŧ	ì	ı		ŧ
H			tion	tial
Motor	Test	Gage	Location	T initial

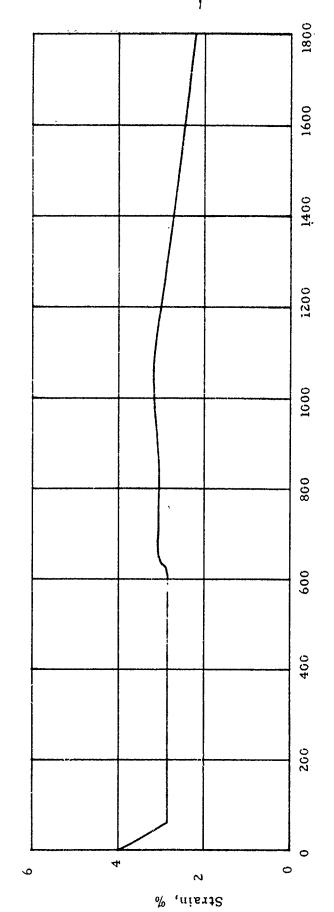
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$



Bore Strain Results to Aeroheat Loads. Gage C2-15 Test A-4

IM ≠2	A-5 (HSMH)	C2-15	Fwd	-65°F
Motor	Test	Gage	Location	T initial

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $^{+170}^{\circ}\text{F}$



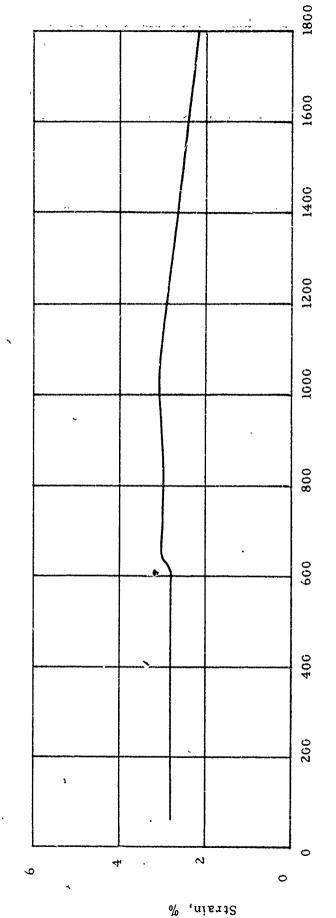
Time, Seconds

Bore Strain Results to Aeroheat Loads. Gage C2-15 Test A-5

IM #2	A-6 (HSMH)	C2-15	Fwd	-65°F
1	ı	1	ł	ŀ
•				
			•	
Motor	Test	Ga ge.	Location	T initial

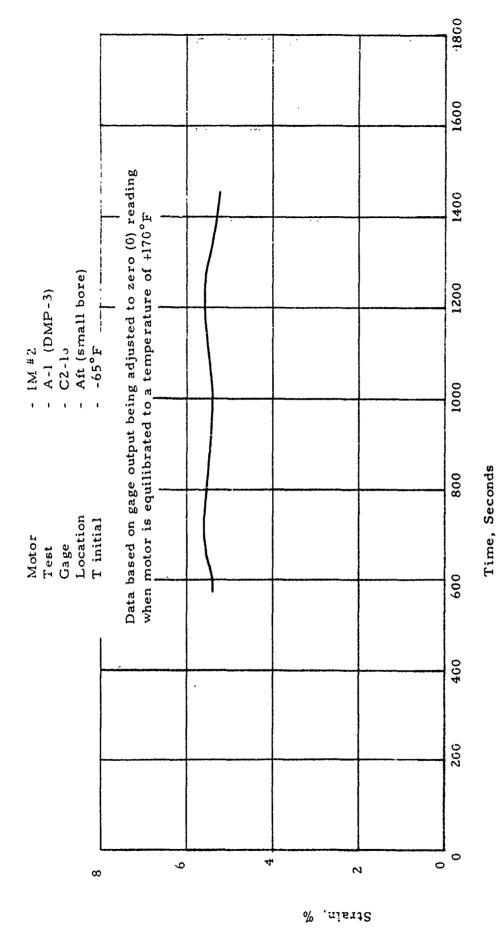
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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} \mathrm{F}$



Time, Seconds

Bore Strain Results to Aeroheat Loads. Gage C2-15 Test A-6

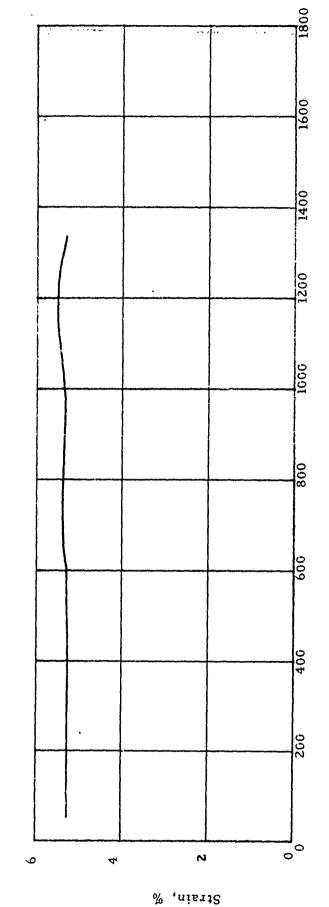


Bore Strain Response to Aeroheat Loads. Gage C2-16 Test A-1

Motor - IM #2 Fest - A-2 (DMP-3) Jage - C2-16 Socation - Aft (small bore) Finitial 650 E
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The second secon

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$

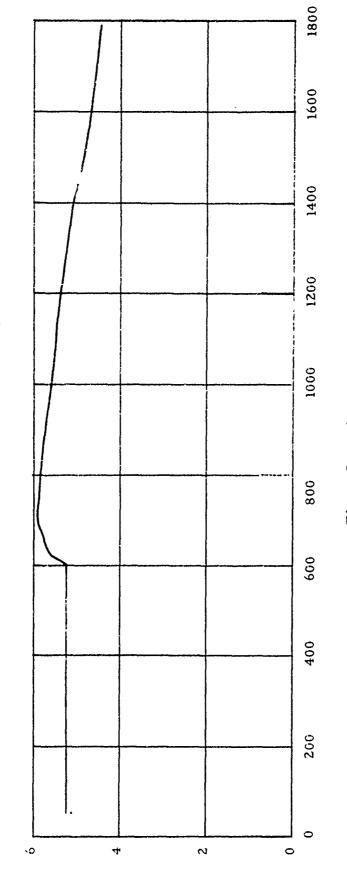


Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-16 Test A-2



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $^4170^{\circ}\mathrm{F}$



Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-16 Test A-3

Strain,

 Motor
 - IM # 2

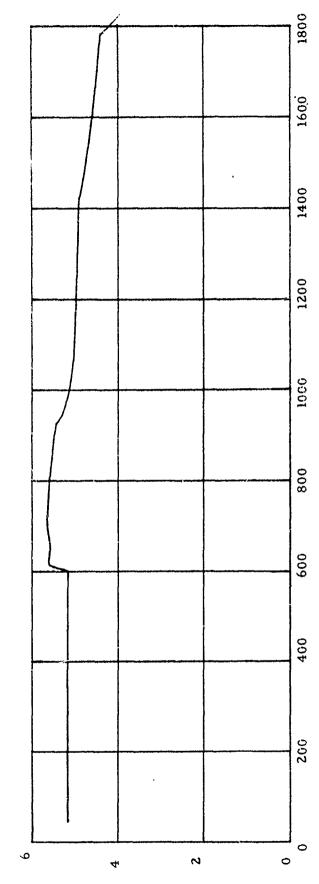
 Test
 - A-4 (SFPI)

 Gage
 - C2-16

 Location
 - Aft (small bore)

 T initial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$.



Bore Strain Response to Aeroheat Loads. Gage C2-16 Test

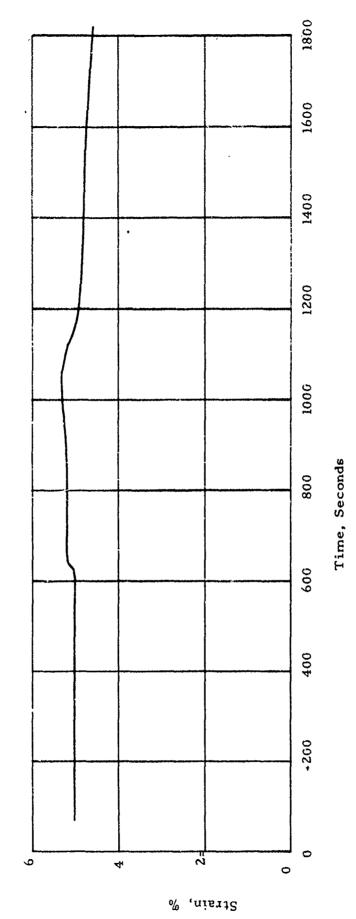
Time, Seconds

A-4

Strain,

- IM#2	A-5 (HSMH)	C2-16	Aft (small bore)	-65°F
١	•	٠	٠	١
Motor	Test	Gage	Location	T initial

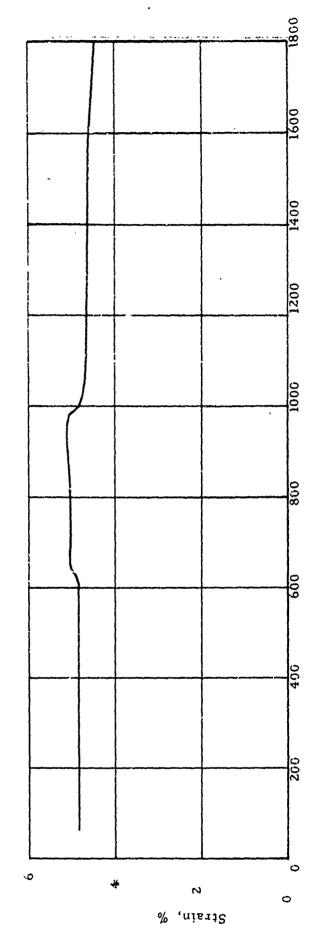
Data based on gage output being adjusted to zero (0) reading when imptor is equilibrated to a temperature of $\pm 170^{\circ} \mathrm{F}$



Bore Strain Response to Aeroheat Loads. (Gage C2-16) Test A-5



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-16 Test A-6

Motor - IM #2

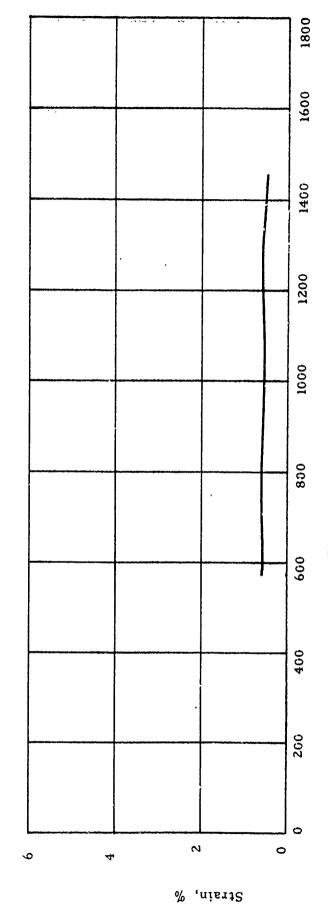
Test - A-1 (DMP-3)

Gage - C2-17

Location - Aft

T initial - -65° F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Time, Seconds

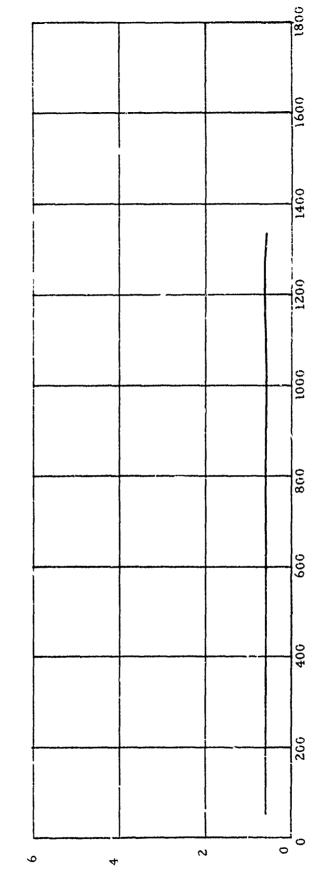
Bore Strain Response to Aeroheat Loads.

Gage C2-17 Test A-1

- IM #2	A-2 (DMP-3)	C2-17	Aft	-65°F
٠	٠	٠	١	1
Motor	Test	Ga ze	Location	T initial

では、これのことできない人をしているからいということです。

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-17 Test A-2

Strain,

Motor - IM #2

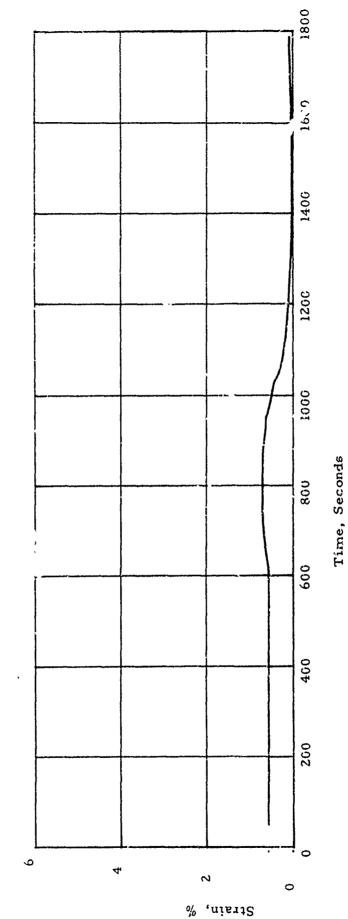
Test - A-3 (SFPI)

Gage - C2-17

Location - Aft

T initial - -65°F

Dita based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} \mathrm{F}$



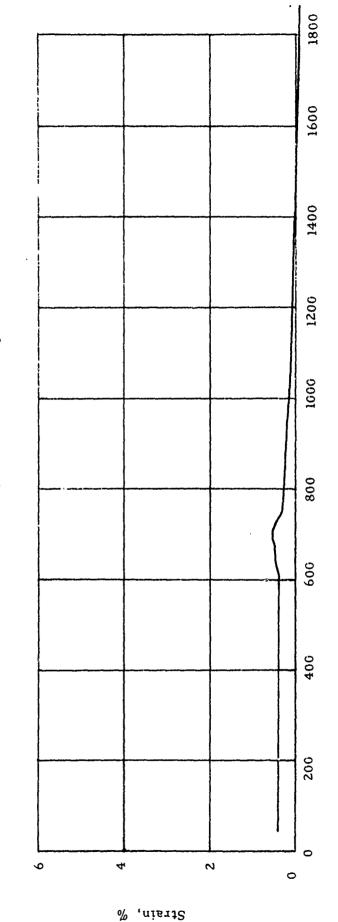
Bore Strain Response to Aeroneat Loads. Gage C2-17 Test A-3

IM #2	A-4 (SFPD	C2-17	Aft	-65%
ı	•	1		1
Motor	Test	Gage	Location	T initial

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170^{\circ}\mathrm{F}$



Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-17 TestA-4

Figure

Motor - 1M #2

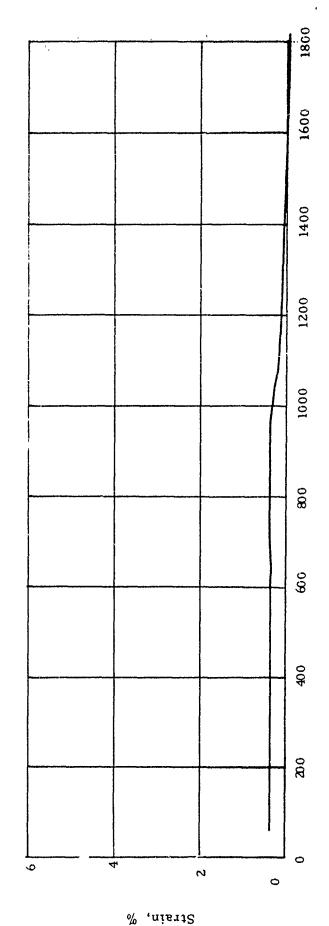
To st - A-5 (HSMH)

Gage - C2-17

Location - Aft

T initial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $470^{\circ}F$



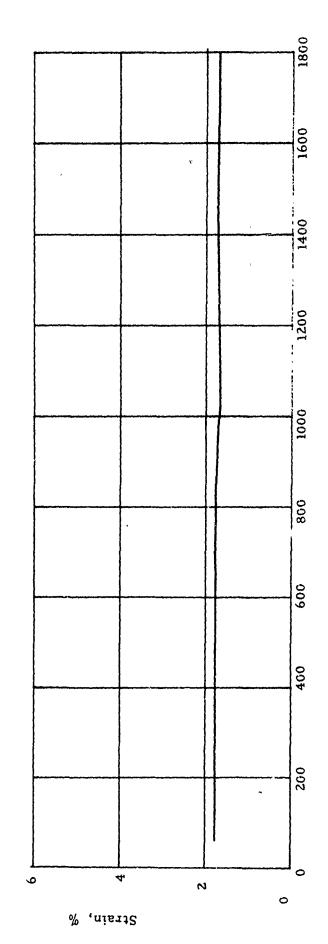
Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-17 Test A-5

.,

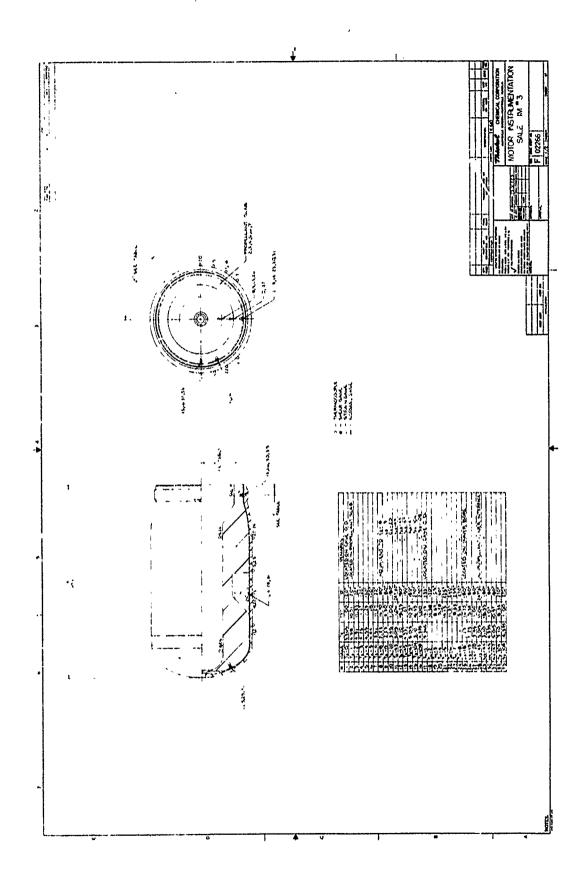
- IM #2	A-6 (HSMH)	C2-17	Aft	-65°F
1	1		ı	١
Motor	Test	Gage	Location	T initial

Data based on gage outp. , being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



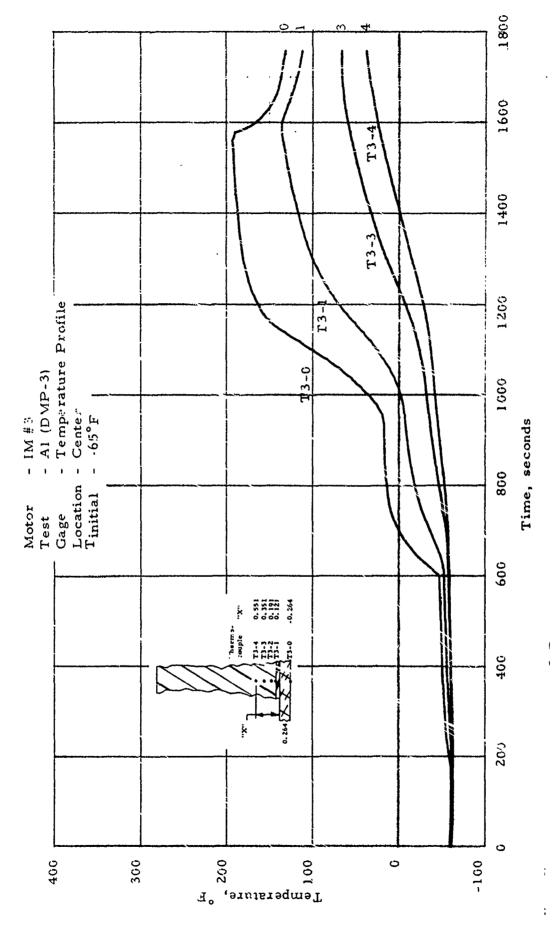
Time, Seconds

Bore Strain Response to Aeroheat Loads. Gage C2-17 Test A-6

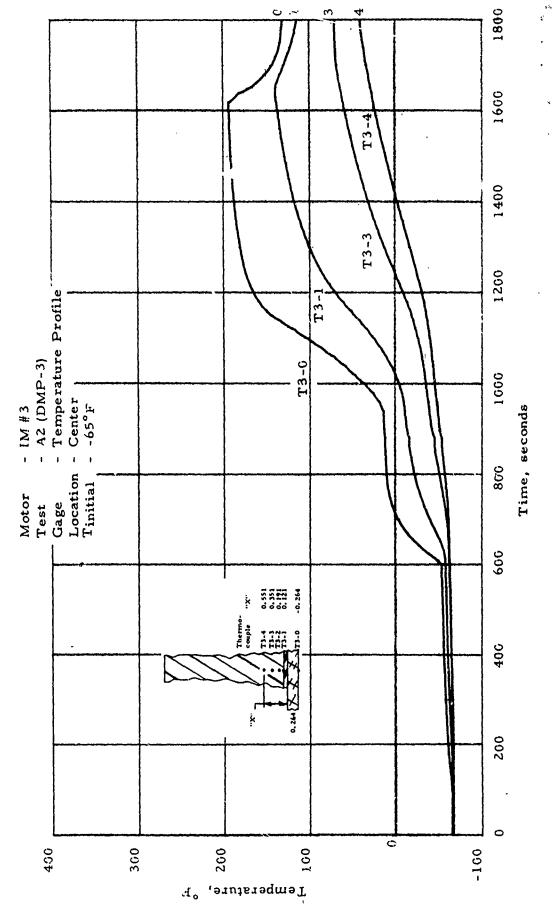


TEST HISTORY OF IM #3

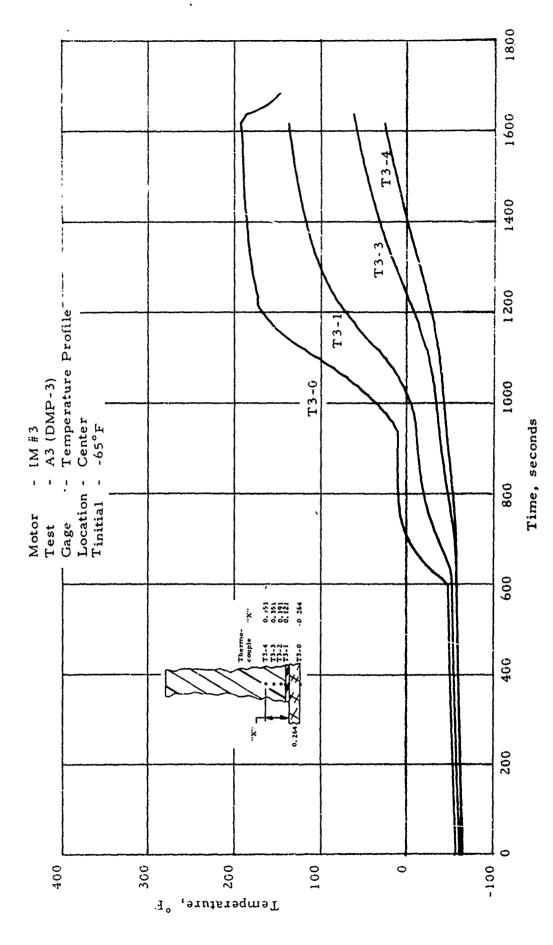
Test	Date	Aeroheat Mission	Initial Motor Temperature, °F
A-1	73 Dec 04 (1335 hrs)	DMP-3	-65
A-2	73 Dec 06 (1330 hrs)	DMP-3	-65
A-3	73 Dec 07 (1320 hrs)	DMP-3	65
A-4	73 Dec 11 (0910 hrs)	HSMH	+55
A-5	73 Dec 21 (1510 hrs)	HSMH	-65
A-6	73 Dec 27 (1300 hrs)	HSMH	-65
A-7	73 Dec 28 (1500 hrs)	SFPI	+ 60
A-8	74 Jan 03 (1520 hrs)	SFPI	0
A-9	74 Jan 04 (1500 hrs)	SFPI	-40
A-10	(د ^{ـــا} 1500 Jan 08 (1500 ا	SFPI	-40
A-11	74 Jan 10 (0830 hrs)	DMP-3	-65
A-12	74 Jan 11 (1350 hrs)	SFPI	-65
A-13	74 Jan 14 (1330 hrs)	SFPI	-65
A-14	74 Jan 15 (1330 hrs)	SFPI	•-65
A-15	74 Jan 16 (1500 hrs)	SFPI	-6 5 .
A-16	74 Jan 17 (1430 hrs)	SFPI	-65
A-17	74 Jan 18 (1300 hrs)	DMP-3	-65



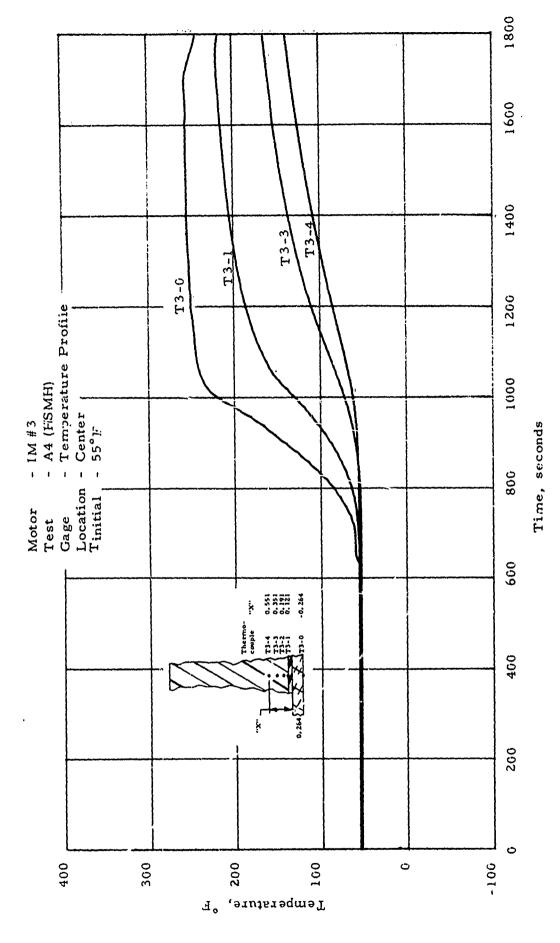
Temperature Profile Mistories for Various Aeroheat Loads (Test No. A-1)



Temperature Profile Histories for Various Aeroheat Loads (Test No. A-2)



Temperature Profile Histories for Various Aeroheat Loads (Test No. A-3)

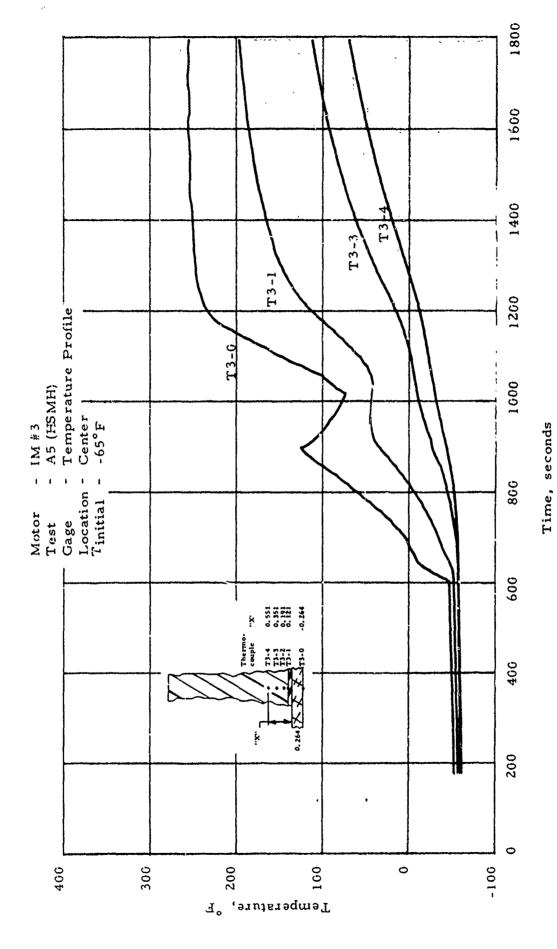


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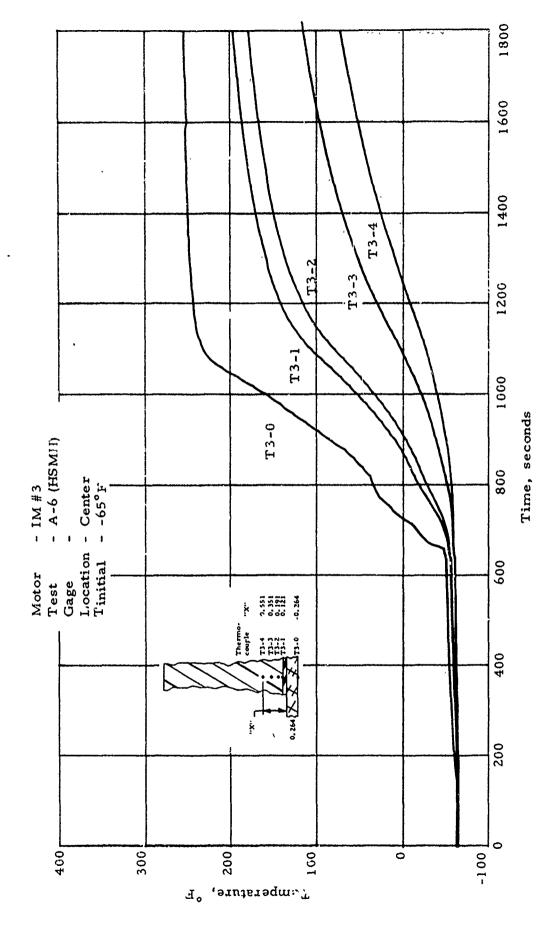
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Temperature Profile Histories for Various Aeroheat Loads (Test No. A-4)

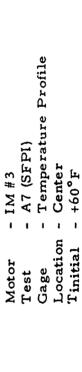
76

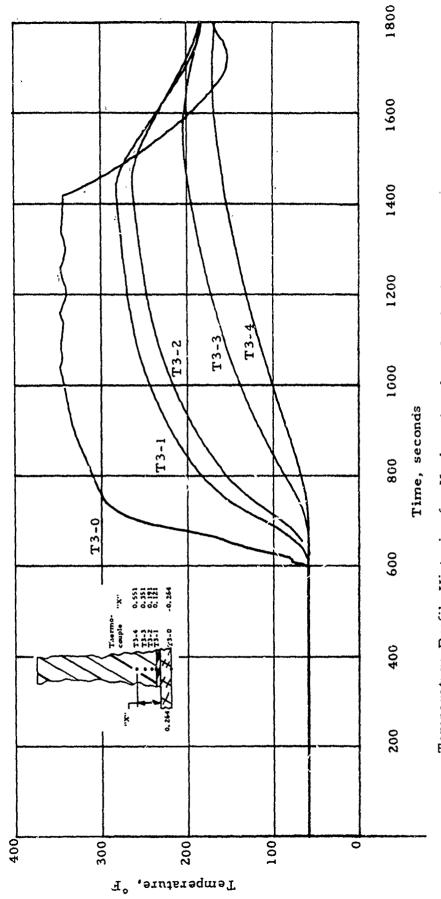


Temperature Profile Histories for Various Aeroheat Loads (Test No. A-5)

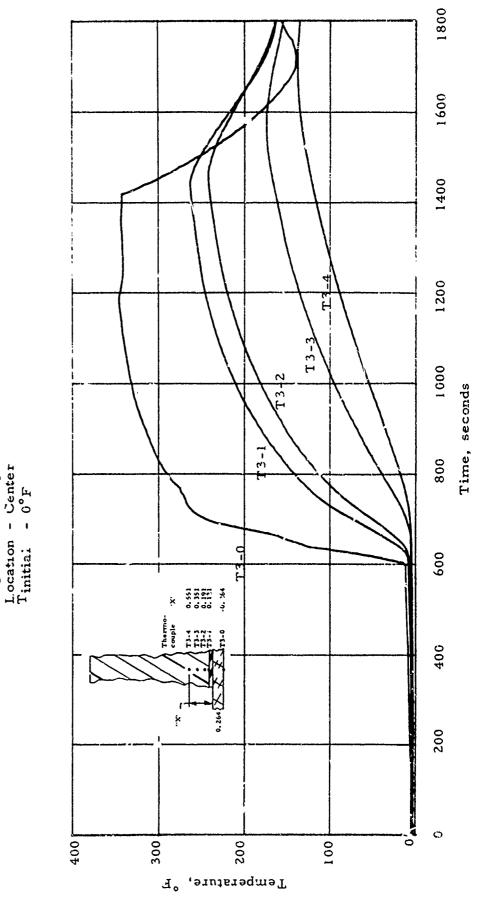


Temperature Profile Histories for Various Aeroheat Loads (Test No. A-6)





Temperature Profile Histories for Various Aeroheat Loads (Test No. A-7)



Temperature Profile

Gage Test

Center 0°F

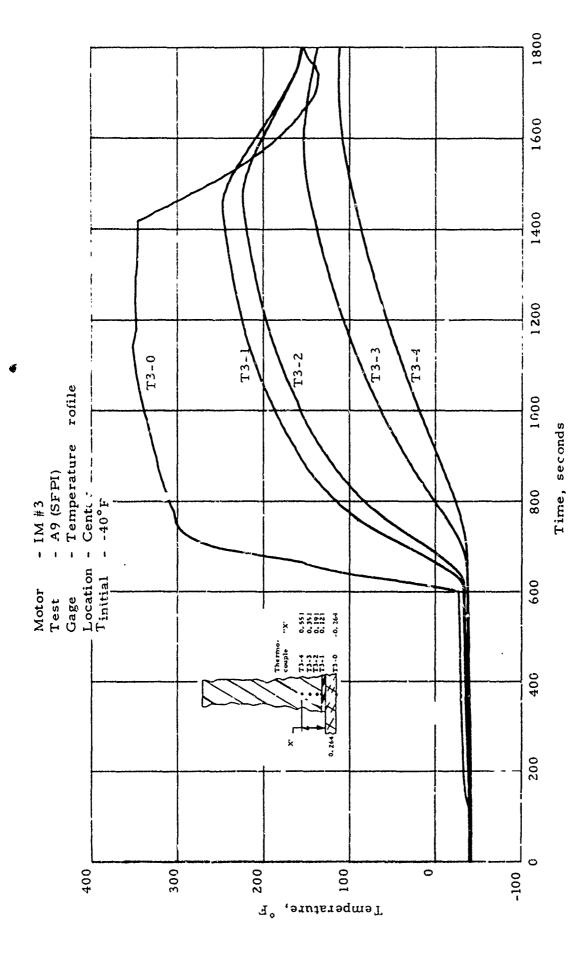
A8 (SFPI)

- iM#3

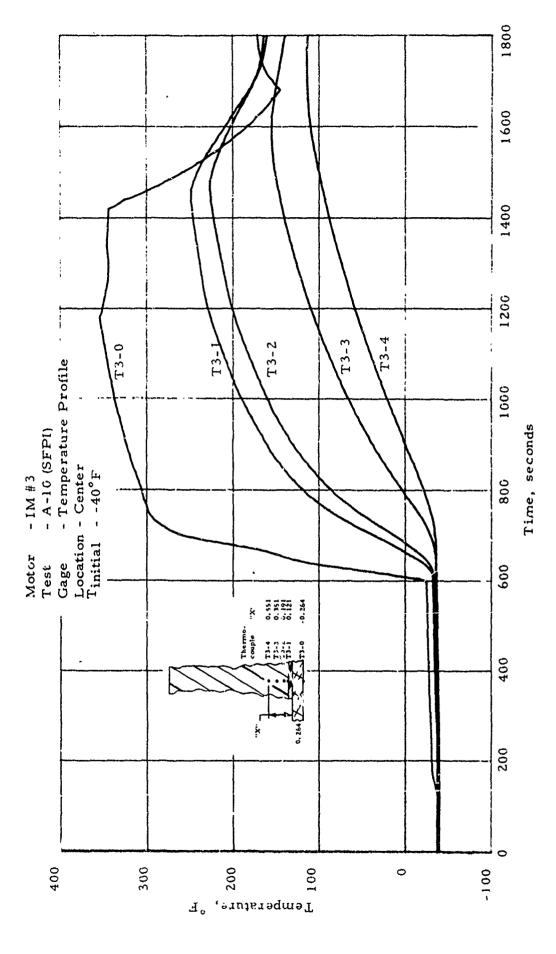
Motor

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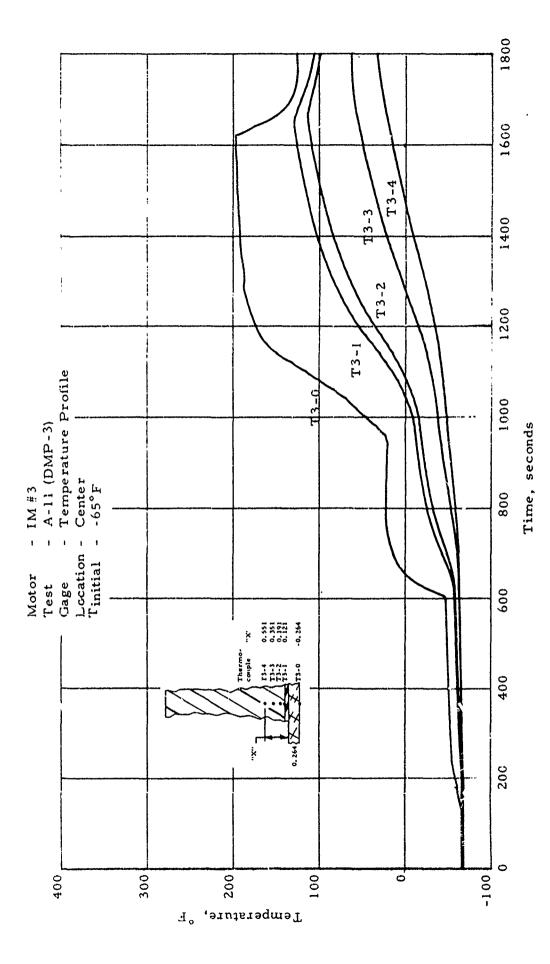
Temperature Profile Histories for Various Aeroheat Loads



Temperature Profile Histories for Various Aereneat Loads

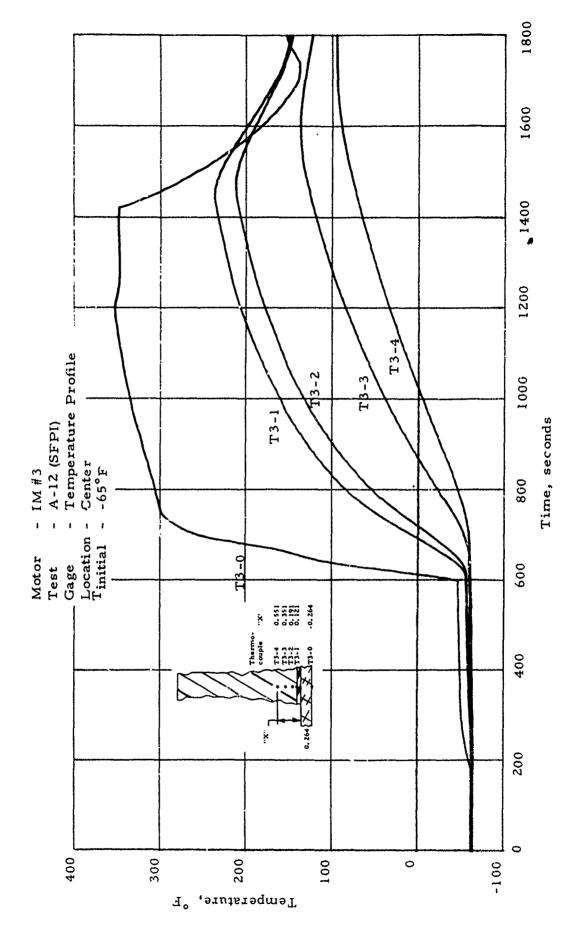


Temperature Profile Histories for Various Aeroheat Loads

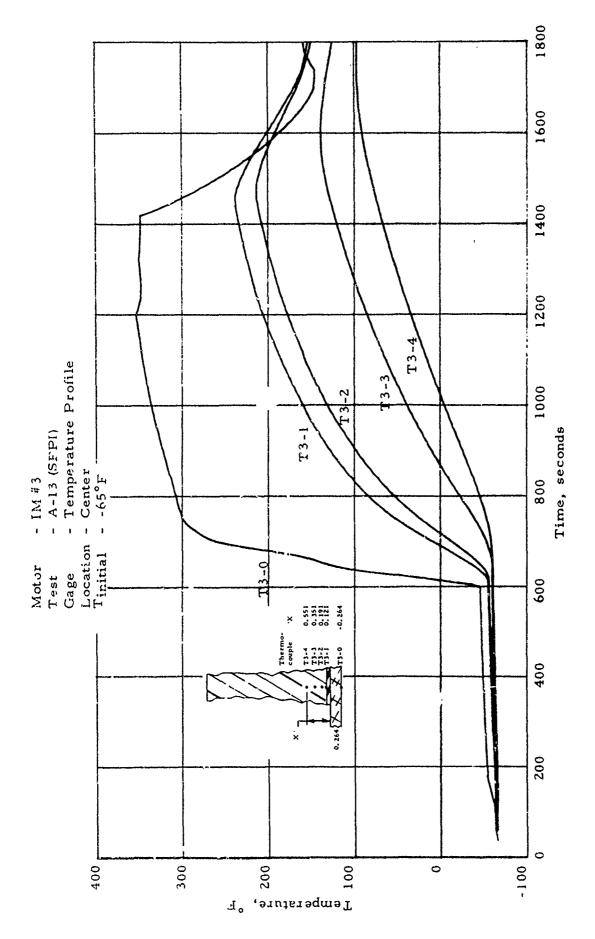


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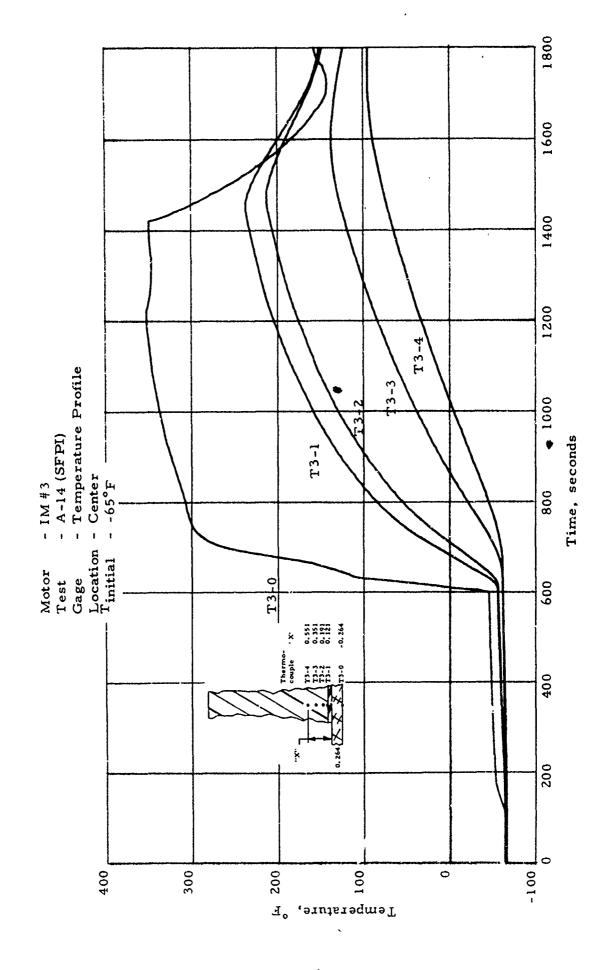
Temperature Profile Histories for Various Aeroheat Loads



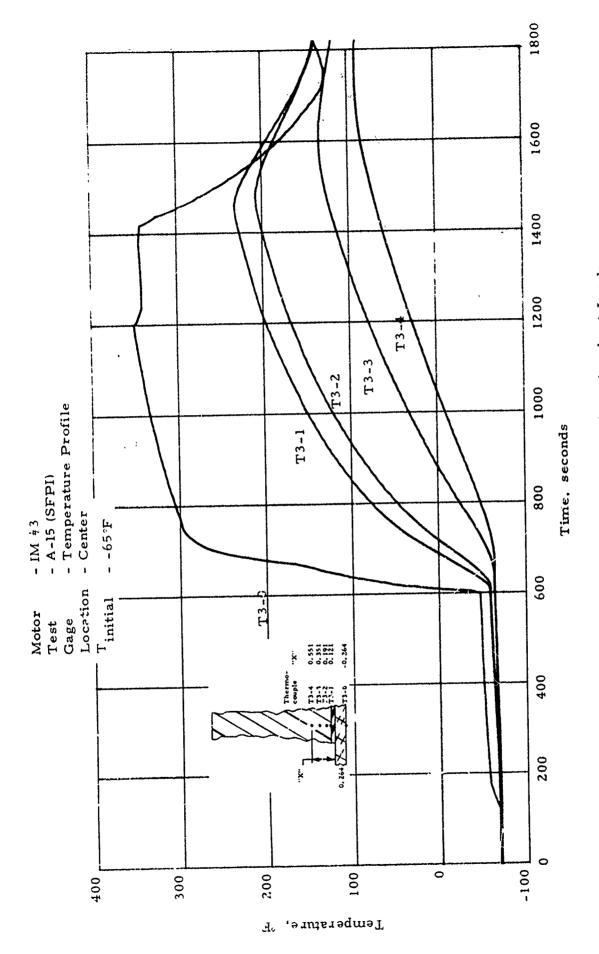
Temperature Profile Histories for Various Aeroheat Loads



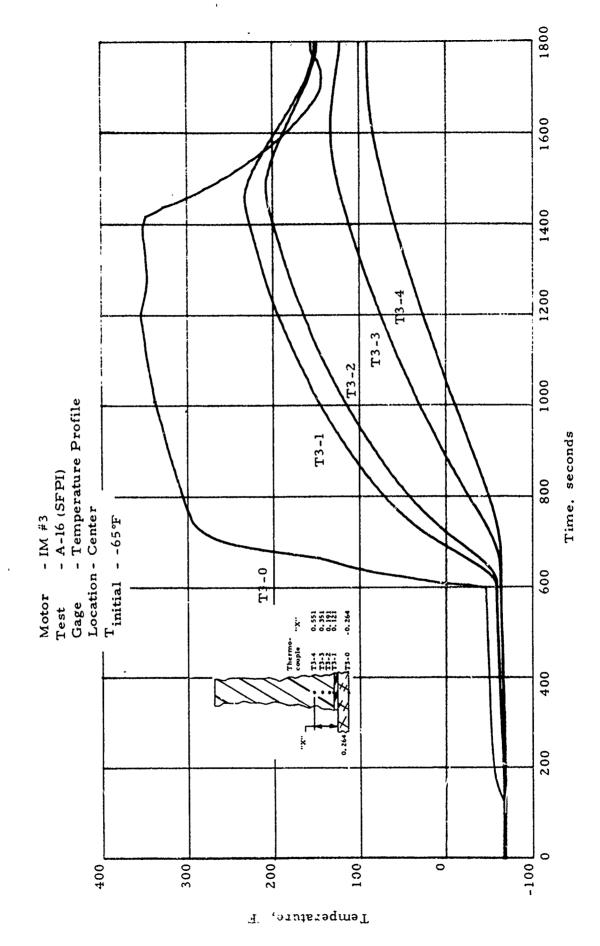
Temperature Profile Histories for Various Aeroheat Loads



Temperature Profile Histories for Various Aeroheat Loads



Temperature Profile Histories for Various Aeroheat Loads



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Temperature Profile Histories for Various Aeroheat Loads

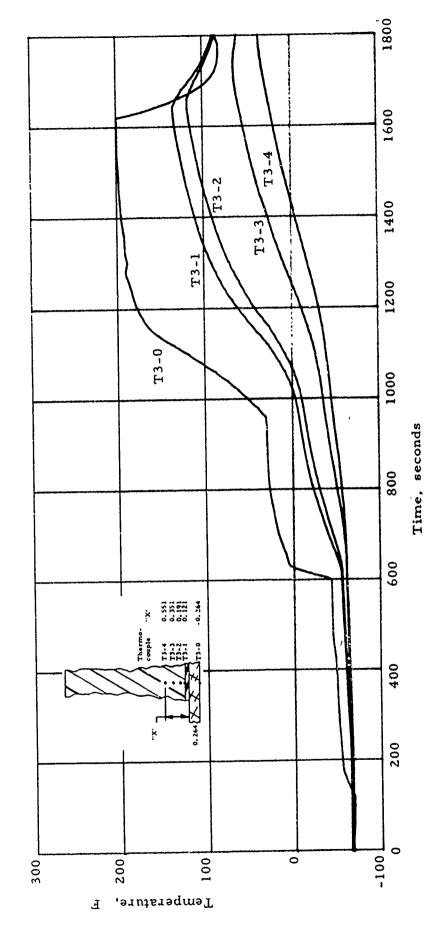
Motor - IM #3

Test - A-17 (DMP-3)

Gage - Temperature Profile

Location - Center

Tinitial --65 F



Temperature Profile Histories for Various Aeroheat Loads

Motor - IM #3

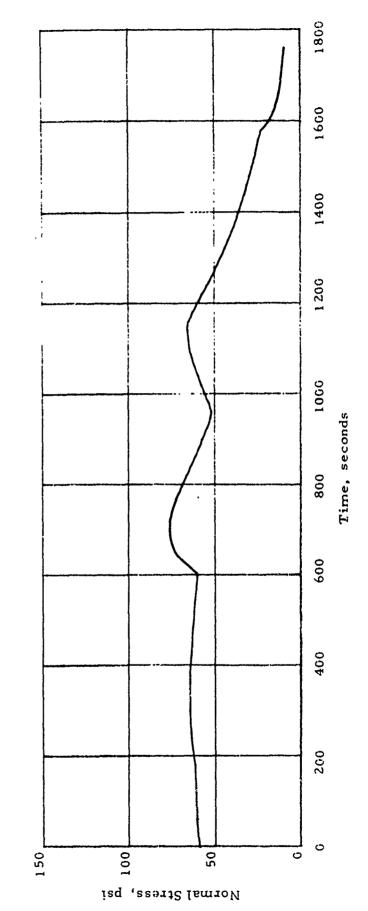
Test - Al (DMP-3)

Gage - N3-44

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$



Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

Motor - IM #3

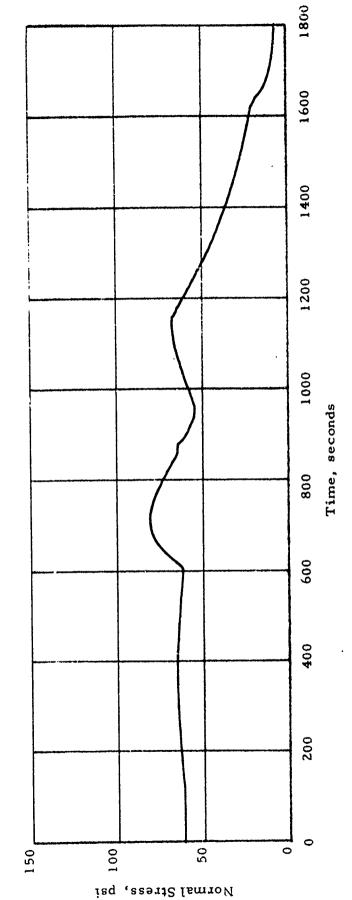
Test - A2 (DMP-3)

Gage - N3-44

Location - Fwd

Tinitial - -55°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $^{+170\,^{\circ}\rm{F}}$

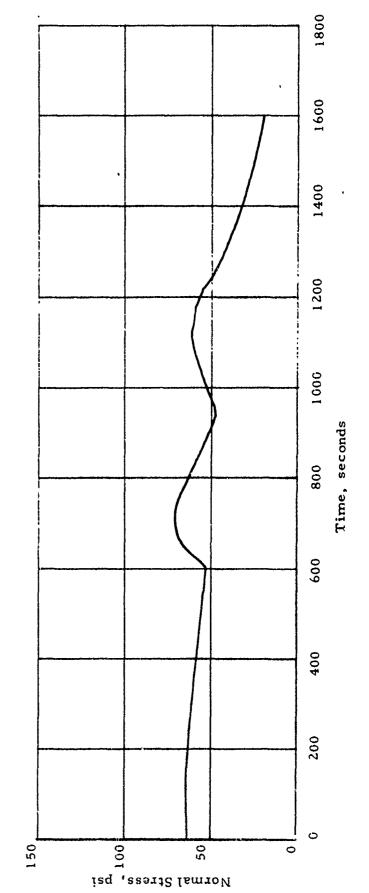


Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

- A3 (DMP-3) - N3-44 -65°F - Fwd Location **Tinitial** Motor Gage Test

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

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Motor - IM #3

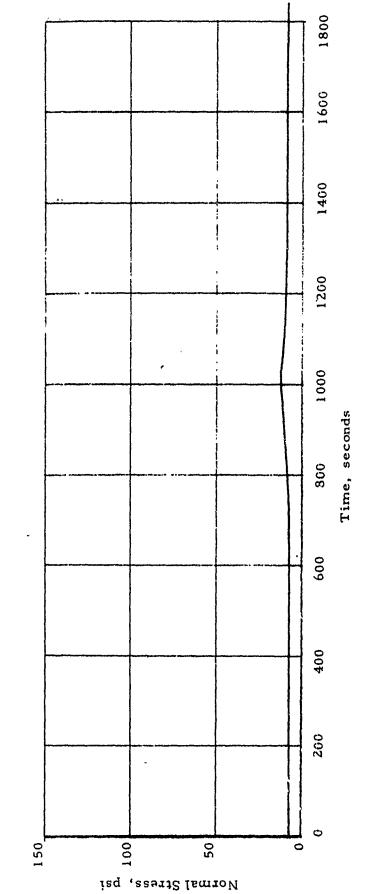
Test - A4 (HSMH),

Gage - N3-44

Location - Fwd

Tinitial - 55°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} \mathrm{F}$



Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

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Motor - 1M #3

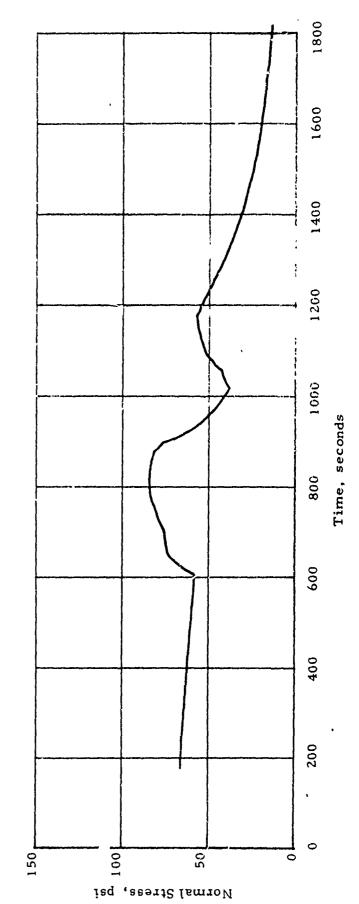
Test - A5 (HSMH)

Gage - N3-44

Location - Fwd

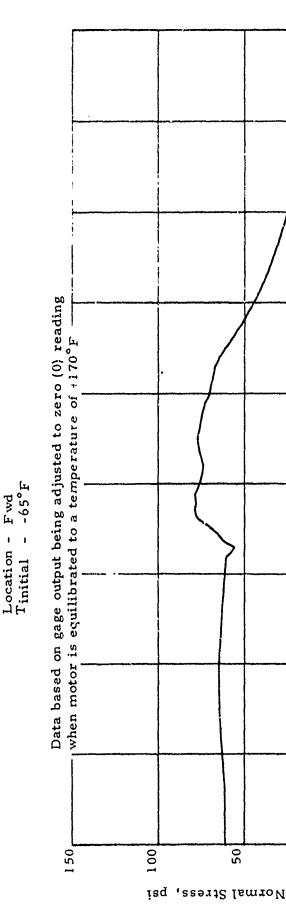
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

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A6 (HSMH)

- IM#3

Motor

N3-44

Gage Test

Fwd

Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

1800

1600

1400

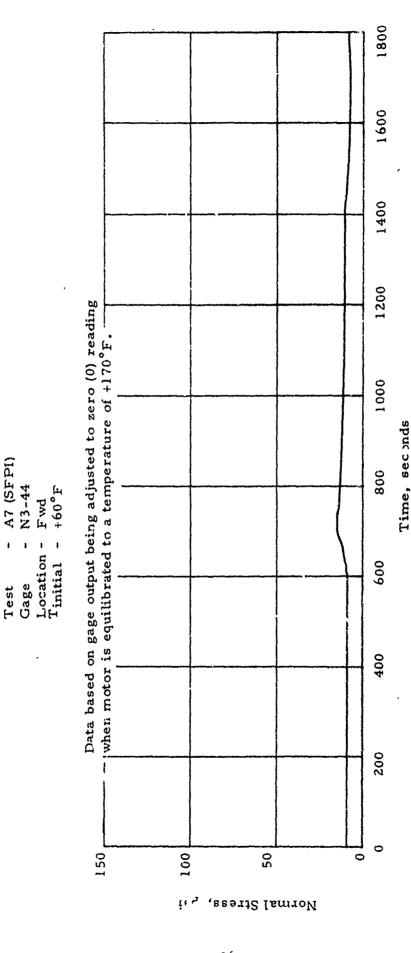
1200

1000

800

900

Time, seconds

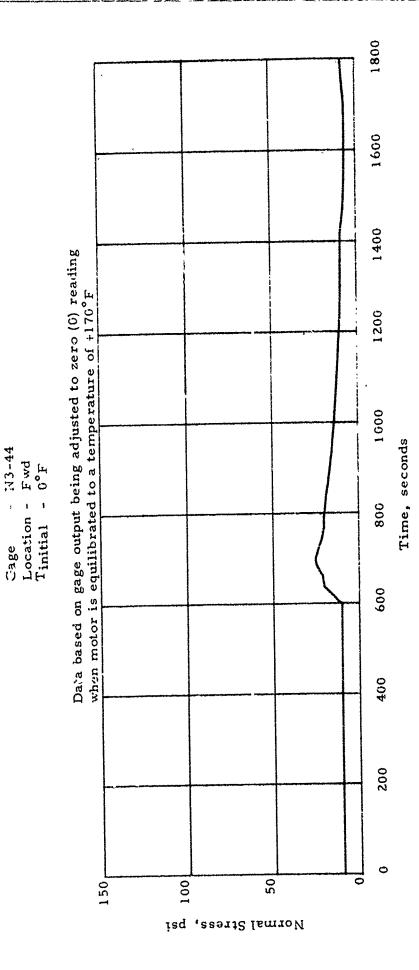


1M#3

Motor

Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

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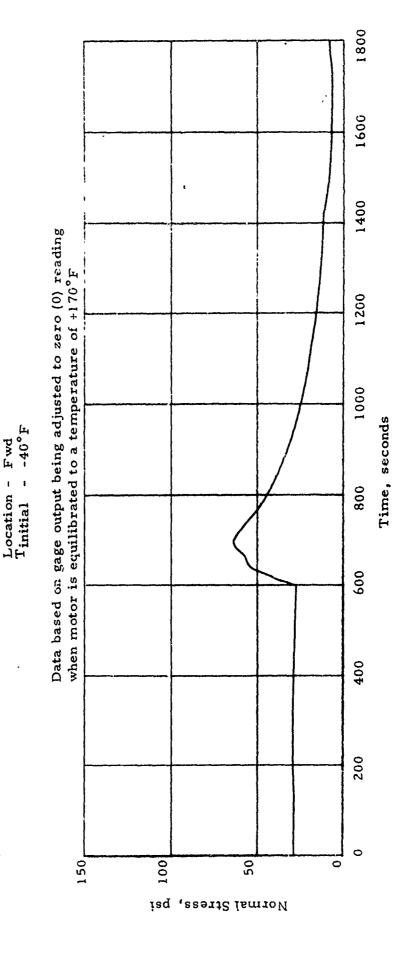
A3 (SFPI)

IM 7.3

Motor Test

N3-44

Head End Normal Stress Response to Aeroheat Loads -- G2 se N3-44



A9 (SFPI)

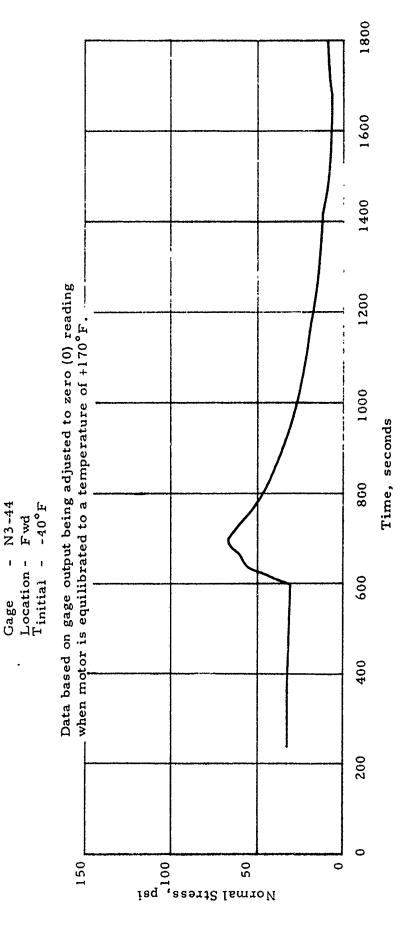
- IM#3

Motor Test Gage

N3-44

Fwd

Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44



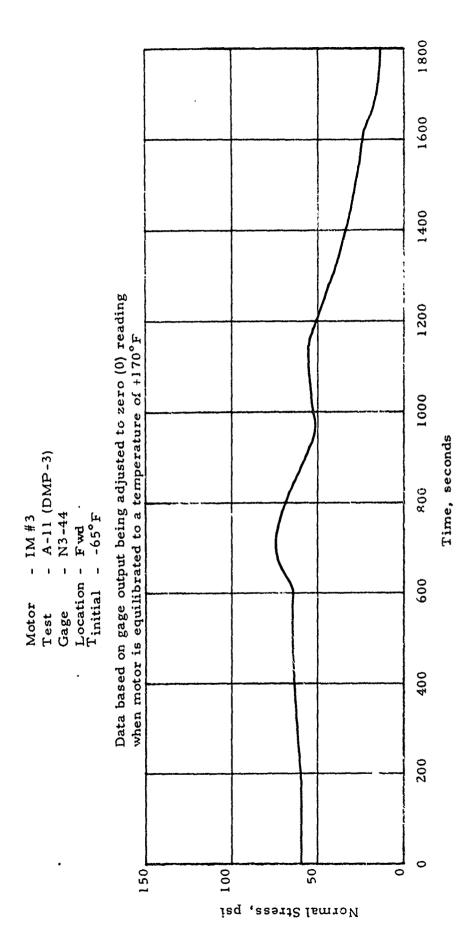
A-10 (SFPI)

IM #3

Motor

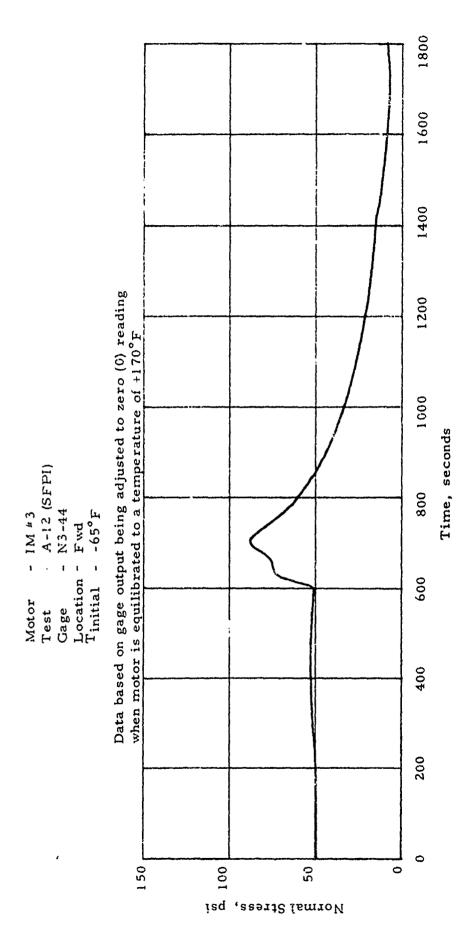
Test

Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

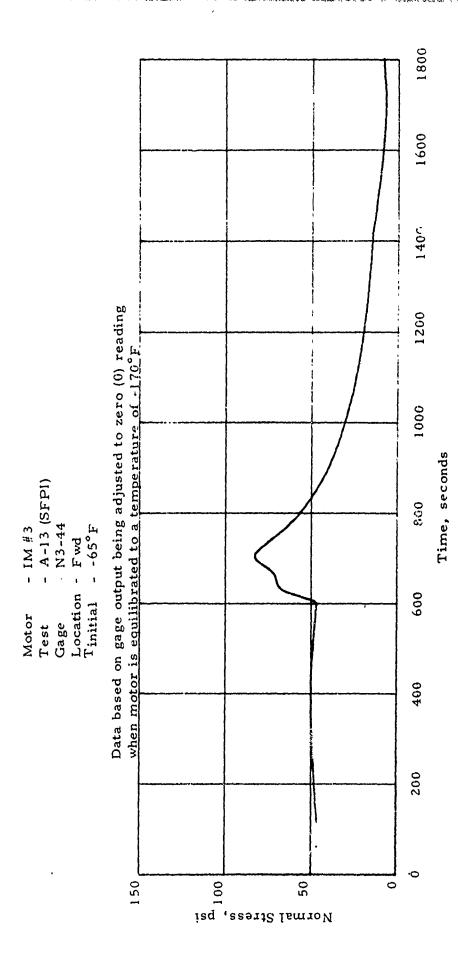


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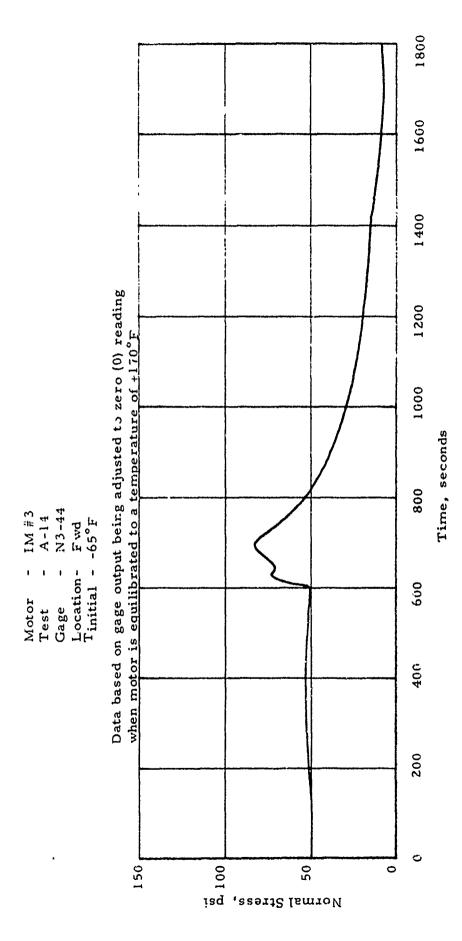
Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44



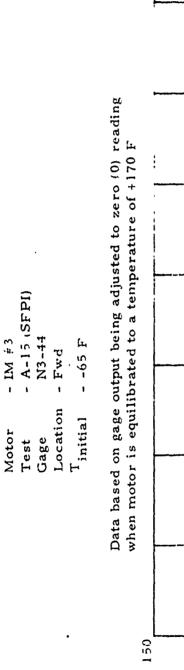
Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

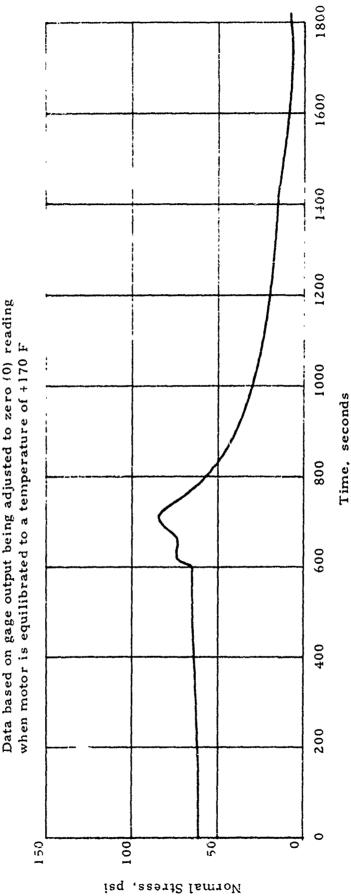


Head End Normal Stress Response to Acroheat Loads -- Gage N3-44



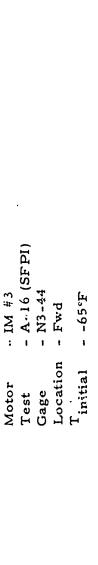
Head End Normal Stress Response to Aeroheat Loads--Gage N3-44

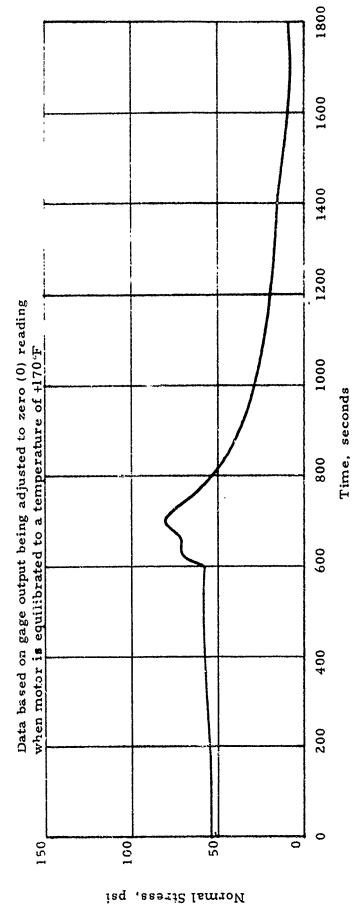




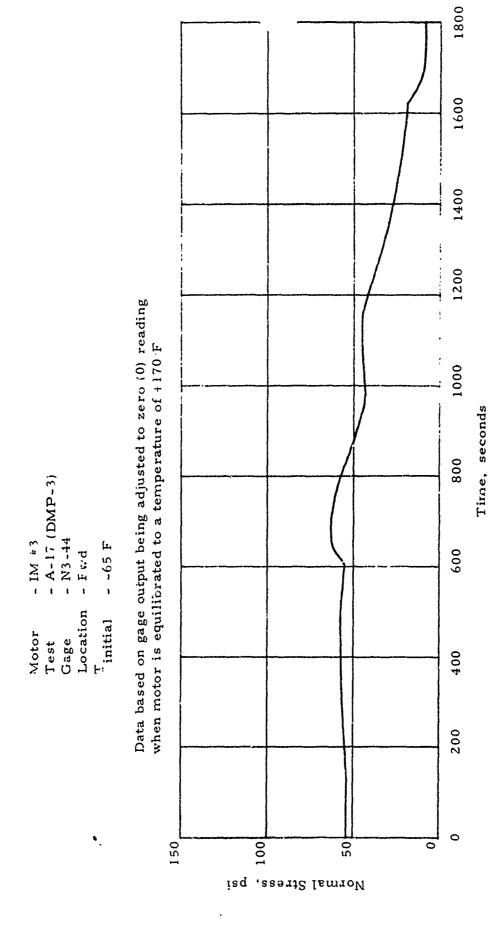
Head End Normal Stress Response to Aeroheat Loads--Gage N3-44

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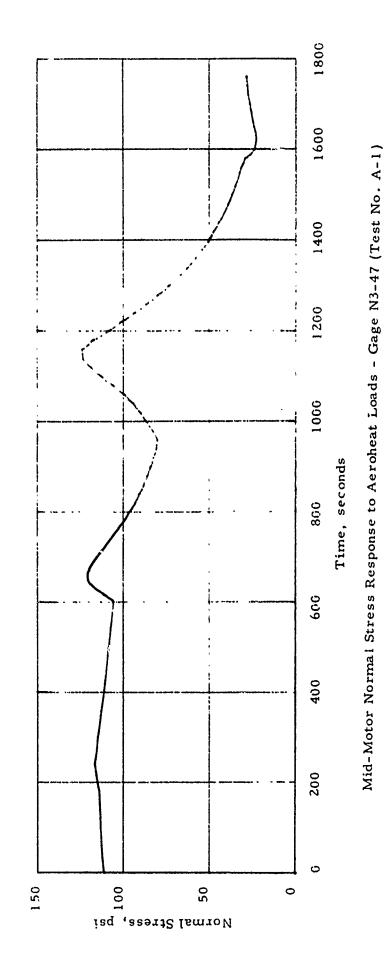
Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44



Head End Normal Stress Response to Aeroheat Loads -- Gage N3-44

Motor - IM #3
Test - Al (DMP-3)
Gage - N3-47
Location - Center
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Motor - IM #3

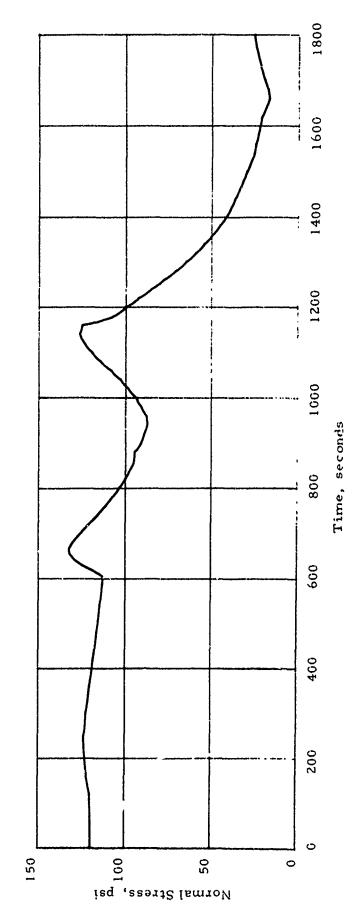
Test - A2 (DMP-3)

Gage - N3-47

Location - Center

Tinitial - -65°F

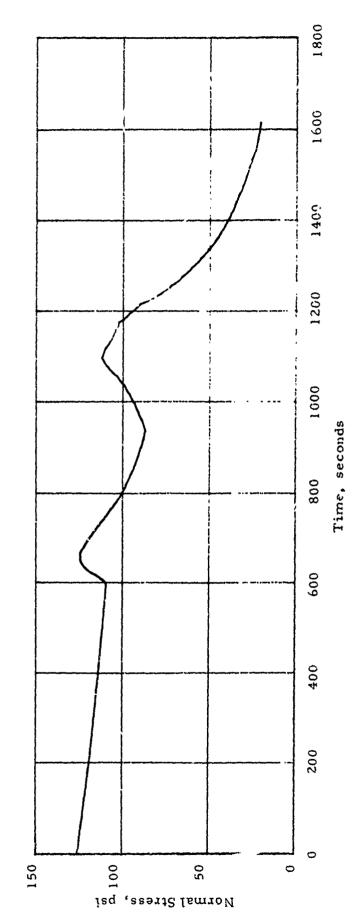
Data based on gage output being adjusted to zero (0) reading when moter is equilibrated to a temperature of +170°F



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-2)

Motor - IM #3 Test - A3 (DMP-3) Gage - N3-47 Location - Center Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor i.; equilibrated to a temperature of -170°F



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-3)

Motor - IM #3

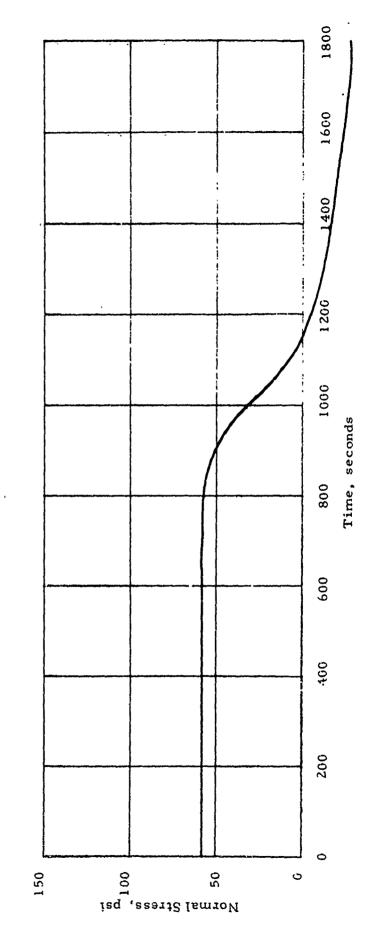
Test - A4 (HSMH)

Gage - N3-47

Location - Center

Tinitial - 55°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} \rm F$



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-4)

Motor - IM #3

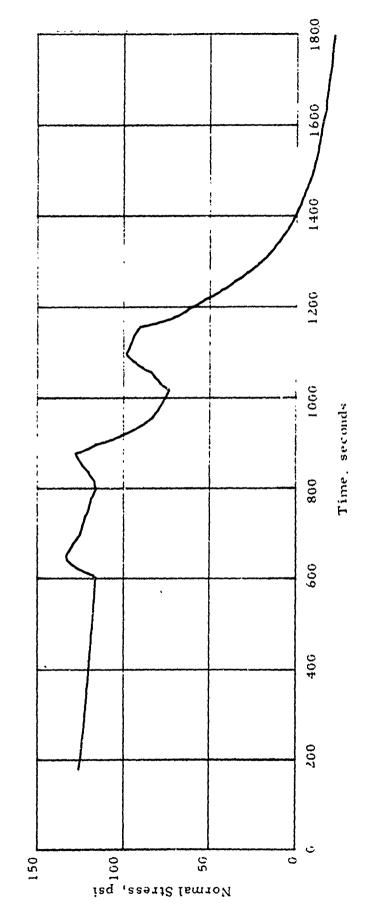
Test - A5 (HSMH)

Gage - N3-47

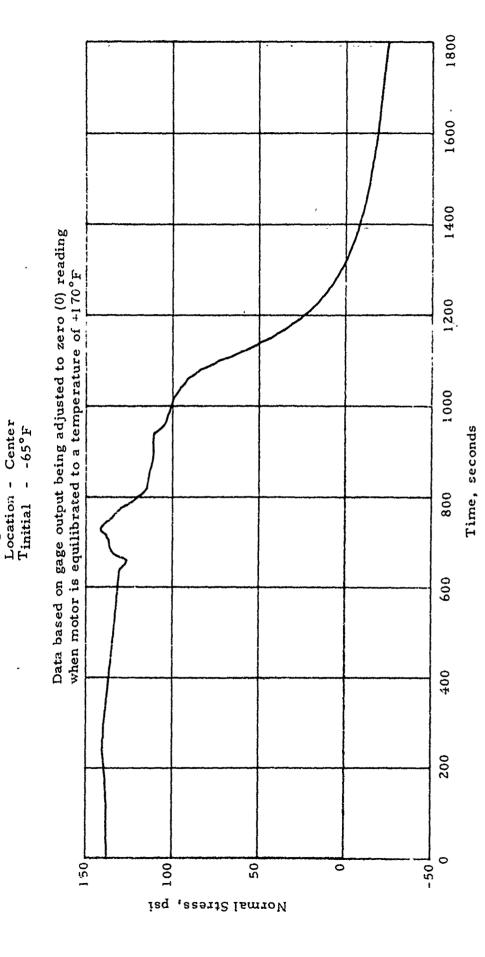
Location - Center

Tinitial - -65°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of +176°F



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-5)



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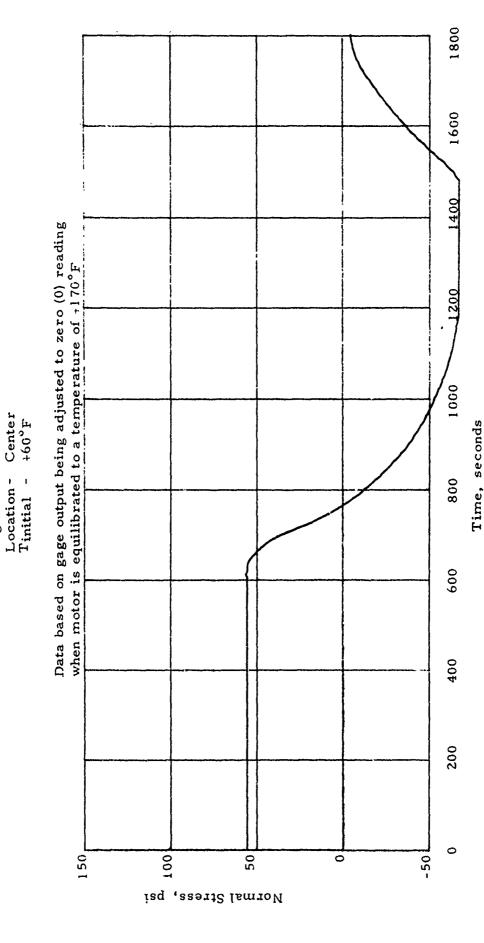
A6 (HSMH)

N3-47

- IM #3

Motor Test Gage

Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-6)



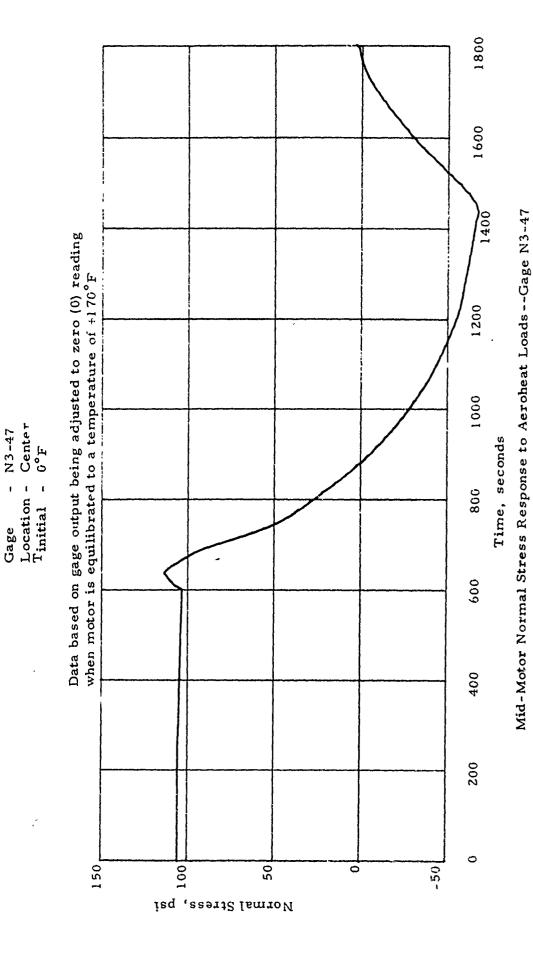
- IM #3 - A7 (SFPI)

Motor

N3-47

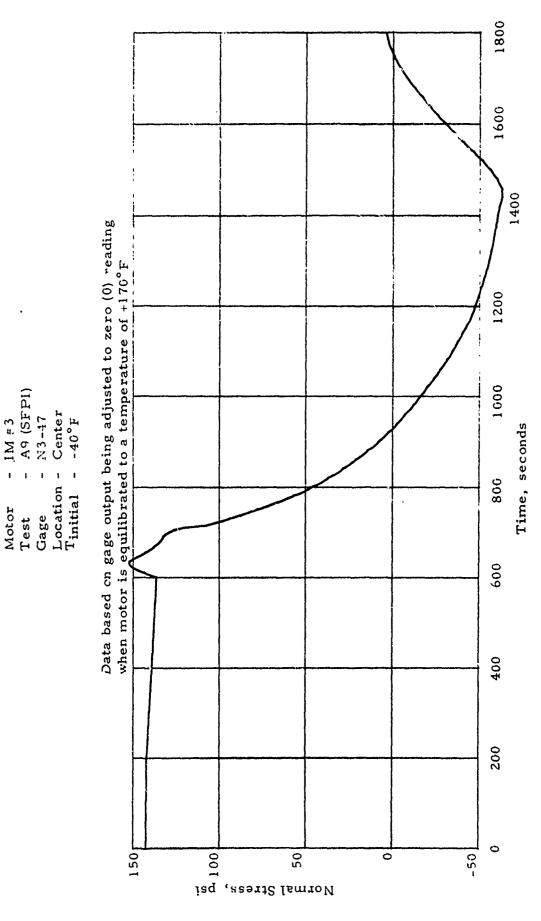
Test Gage

Figure ?-g. Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-47 (Test No. A-7)



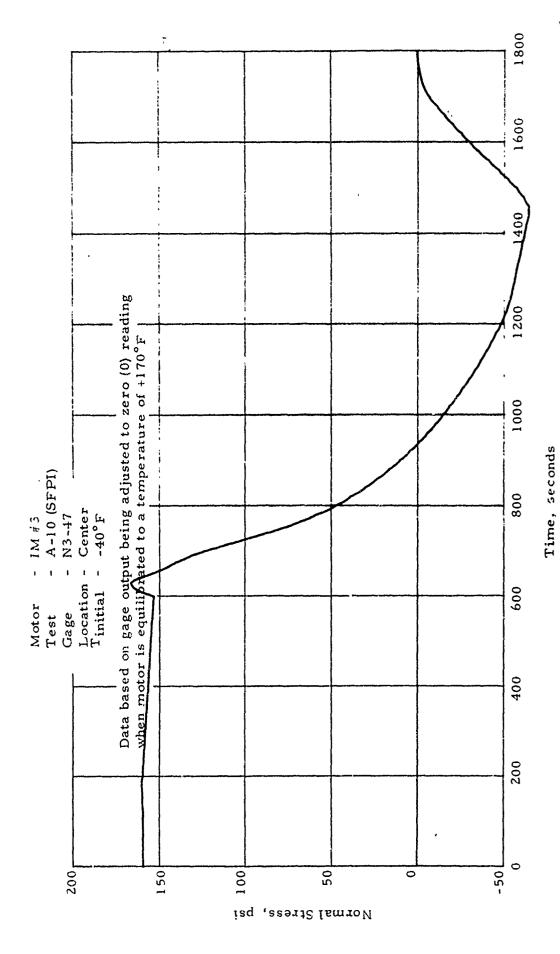
- IM #3 . - A8 (SFPI)

> Motor Test

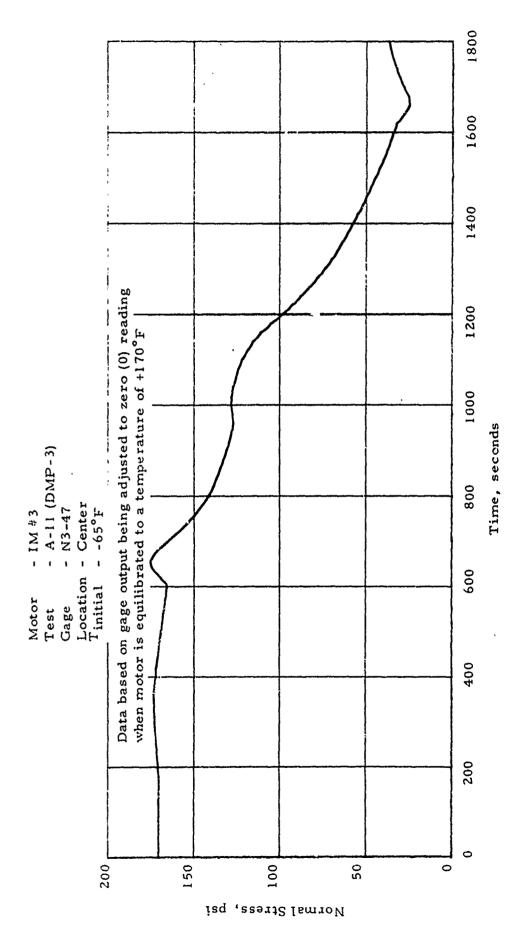


- IM = 3

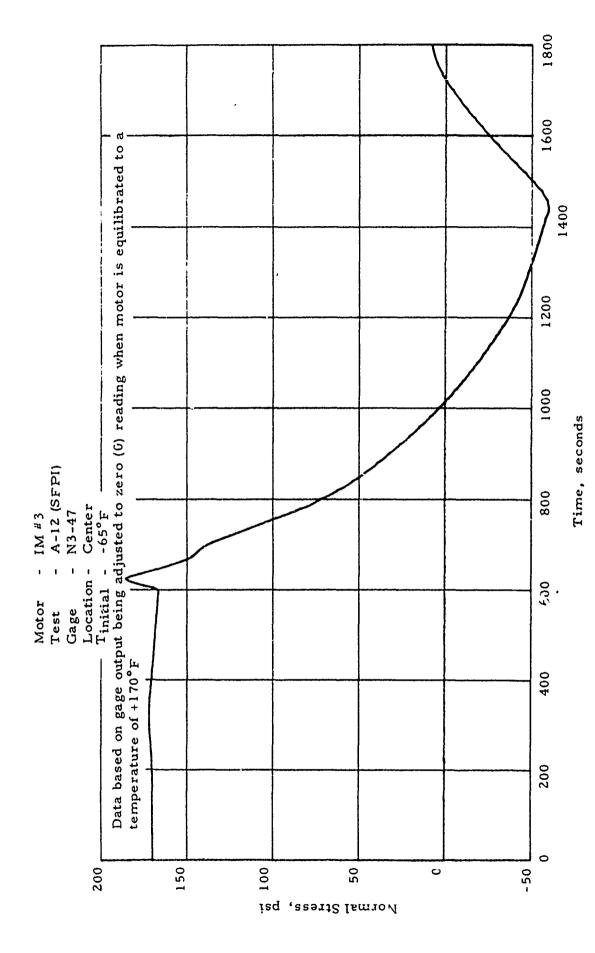
Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-47



Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-47

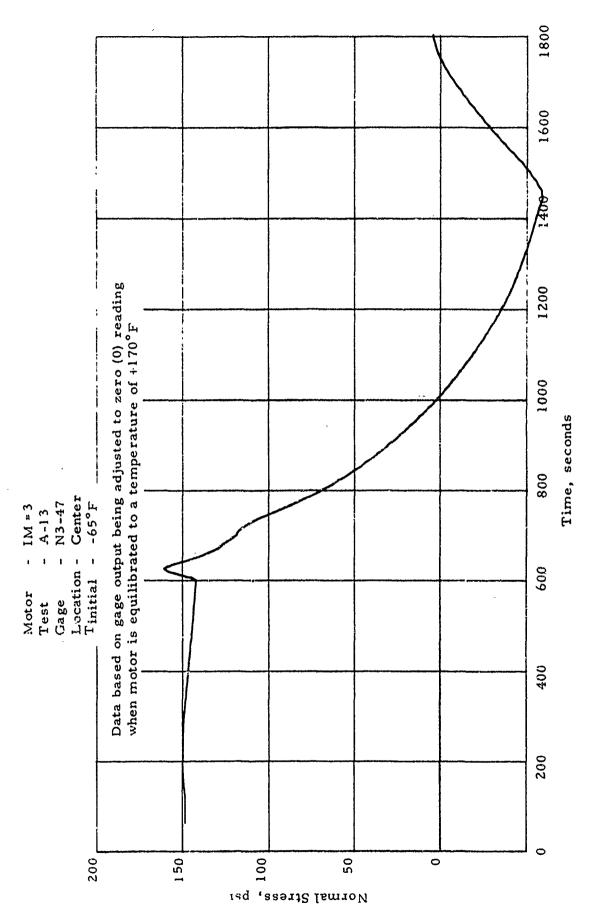


Mid-Motor Normal Stress Response to Aeroheat L ads--Gage N3-47

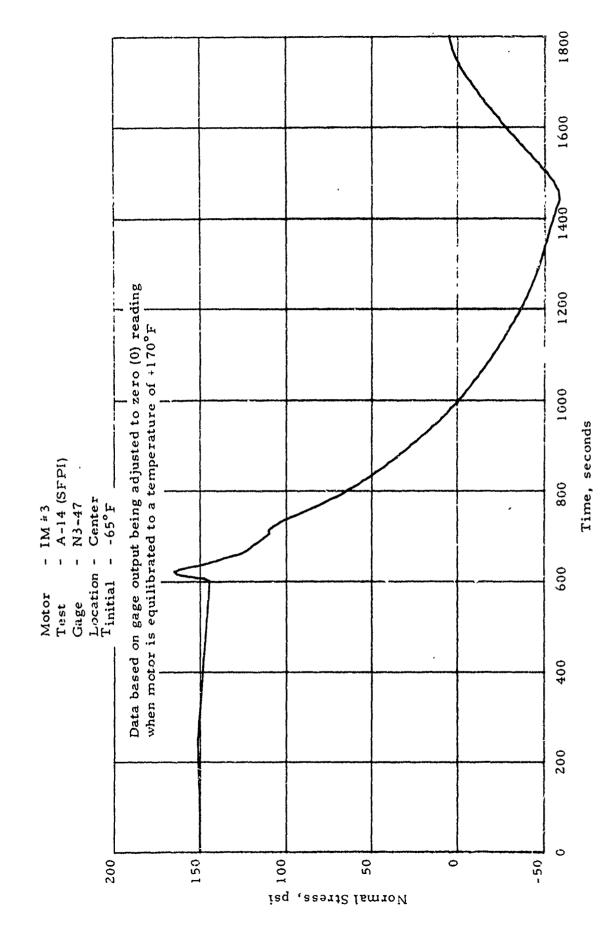


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Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-47



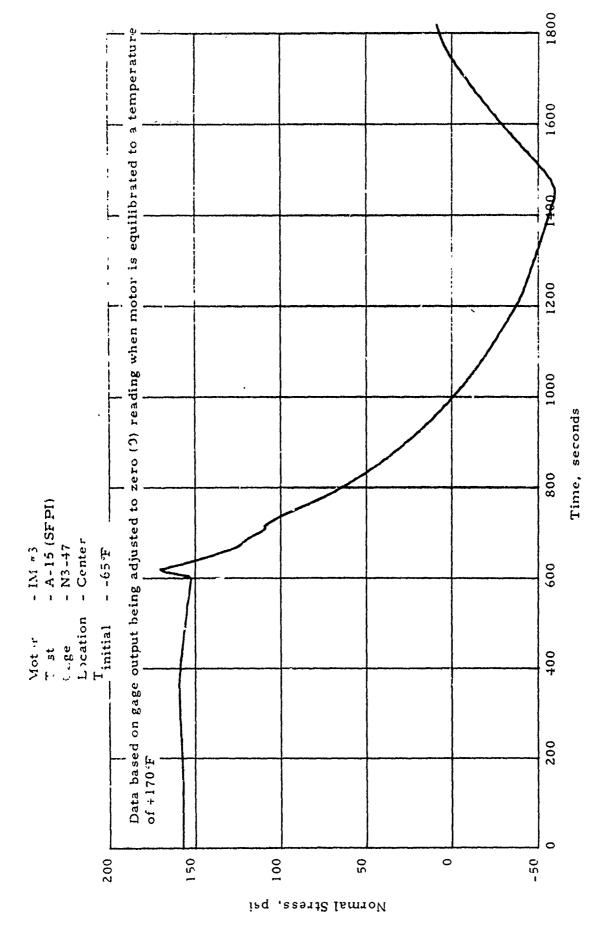
Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-47



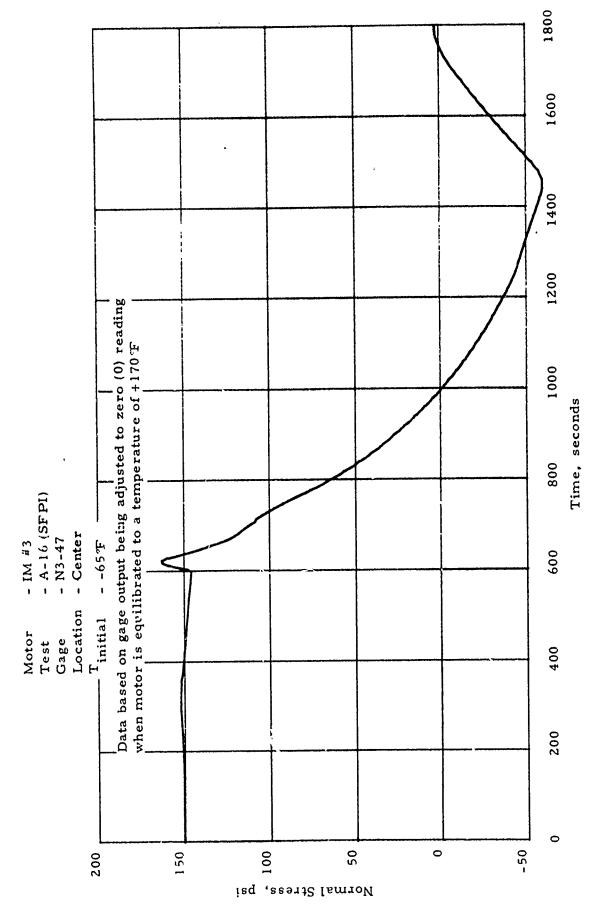
Mid-Motor Normal Stress Response to Aeroheat Loads--Gage N3-47

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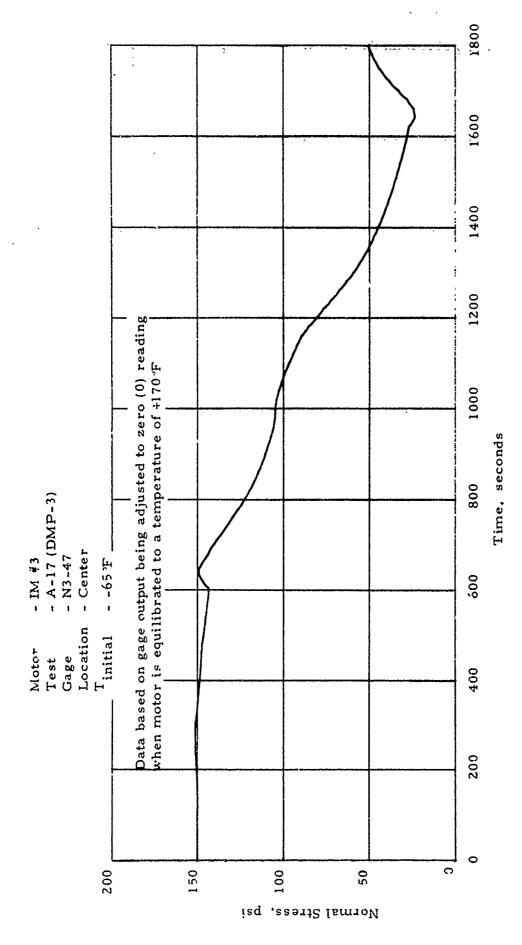


Mid-Motor Normal Stress Response to Aeroheat Loads--Gage N3-47



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Mid-Motor Normal Stress Response to Aeroheat Loads--Gage N3-47



Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-47

Motor - 1M #3

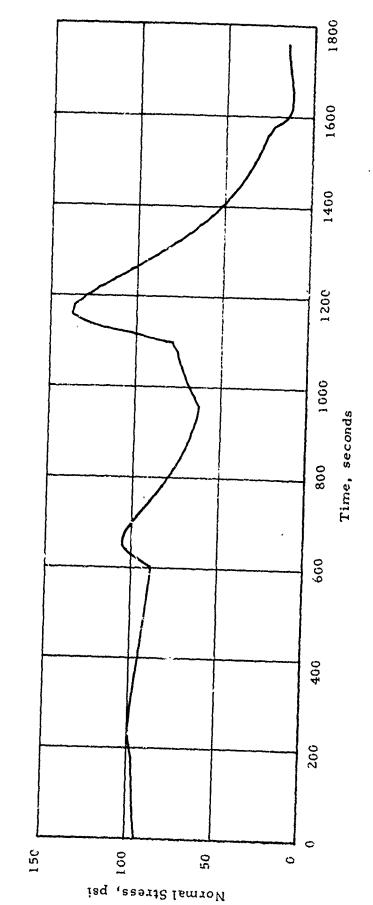
Test - Al (DMP-3)

Gage - N3-43

Location - Center

Tinitial - -65 F

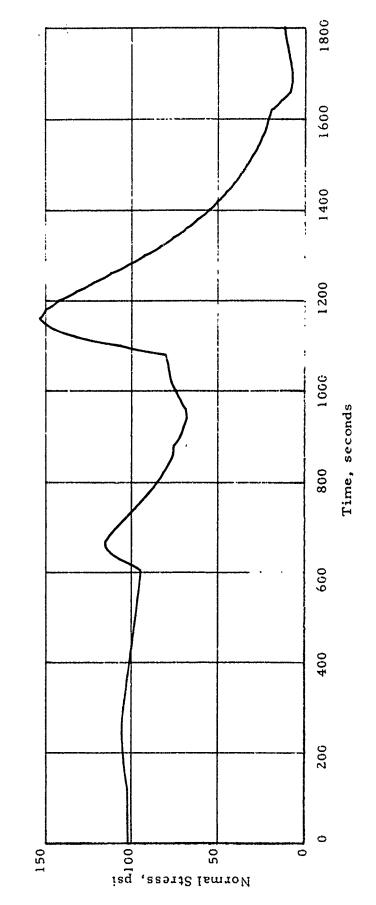
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} {\rm F}$



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-1)

Motor - IM #3
Test - A2 (DMP-3)
Gage - N3-43
Location - Center
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-2)

Motor - IM #3

Test - A3 (DMP-3)

Gage - N3-43

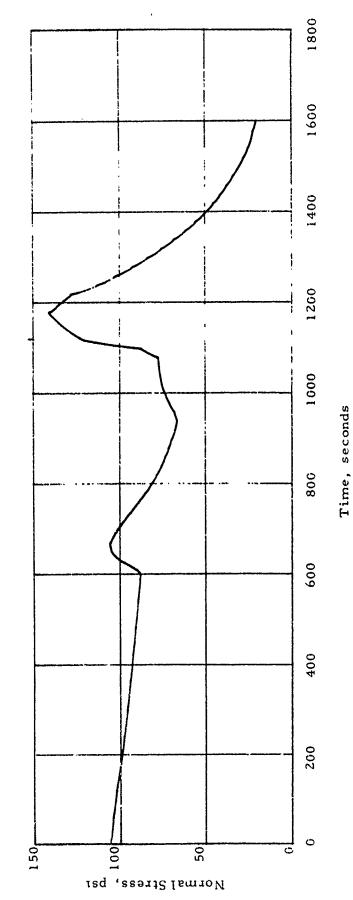
Location - Center

Tinitial - -65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$.

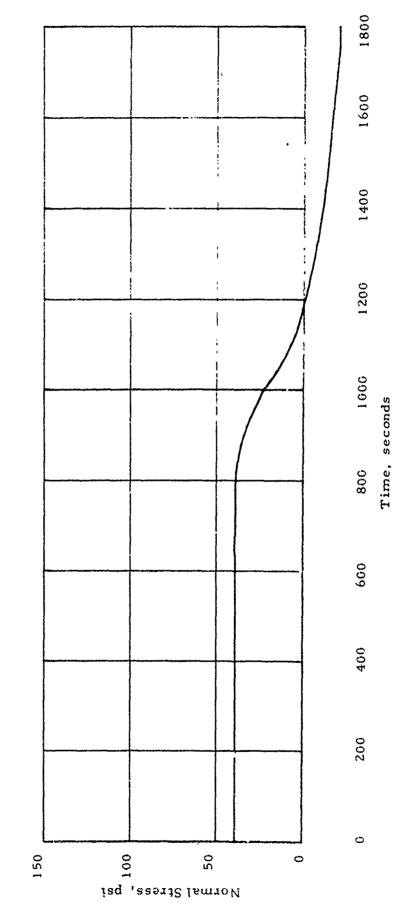


Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-3)

Motor - 1M #3
Test - A4 (HSMH)
Gage - N3-43

Location - Center Tinitial - 55°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$.

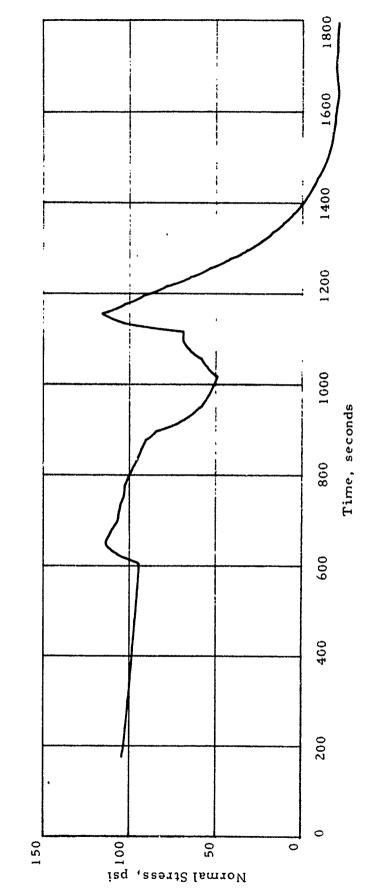


Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-4)

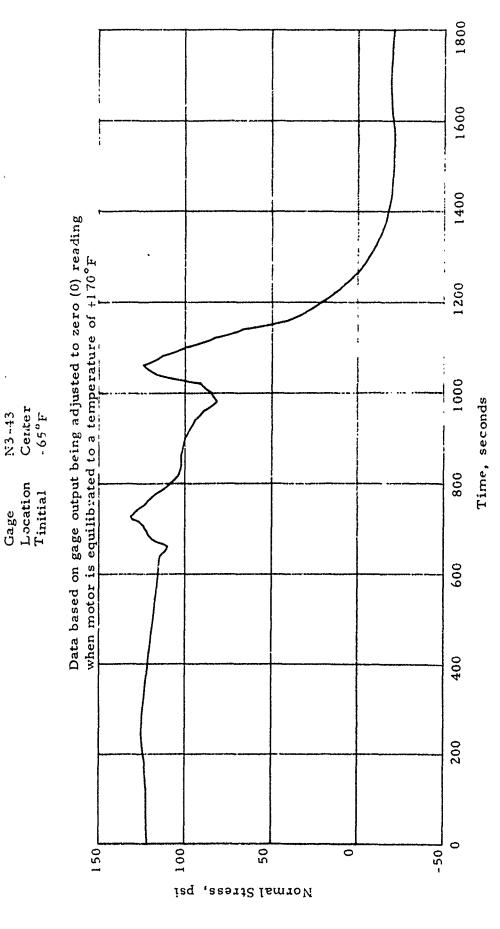
Motor - IM #3
Test - A5 (HSMH)
Gage - N3-43
Location - Center
Tinitial - -65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-5)



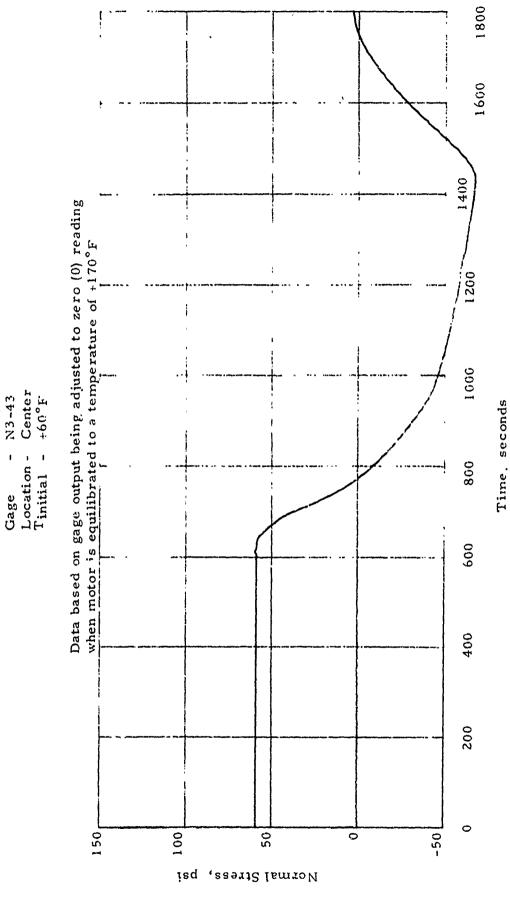
A6 (HSMH)

 $\cdot 1 M \approx 3$

Motor Test

Certer N3-43

Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-6)



A7 (SFPI)

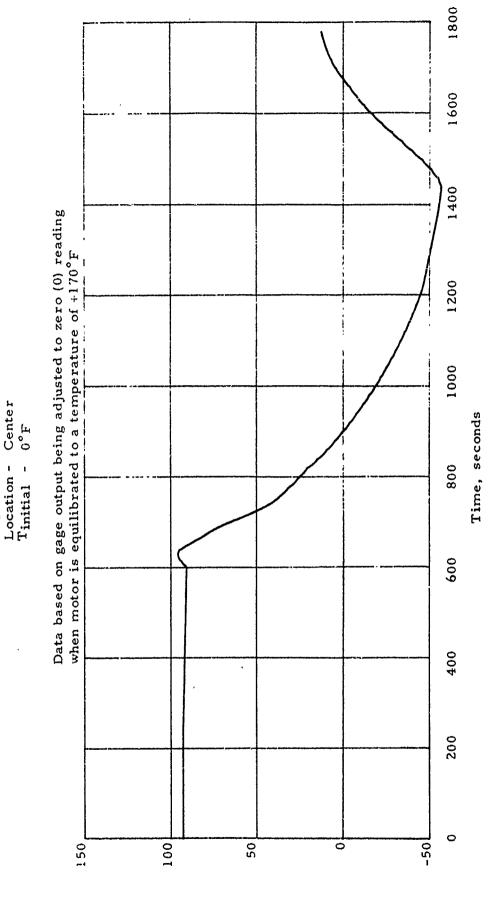
IM #3

Motor

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Test

Mid-Motor Normal Stress Response to Aeroheat Loads - Gage N3-43 (Test No. A-7)



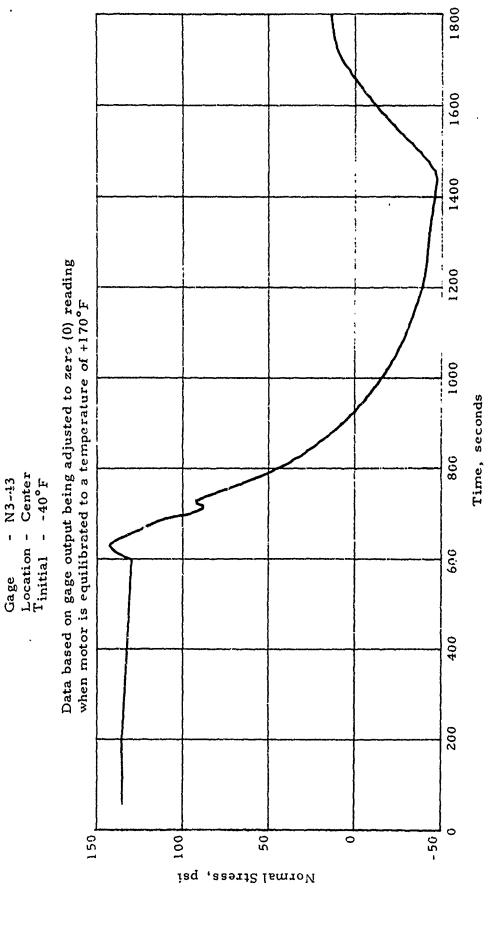
A8 (SFPI) N3-43

IM #3

Motor Test Gage

Center

Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43



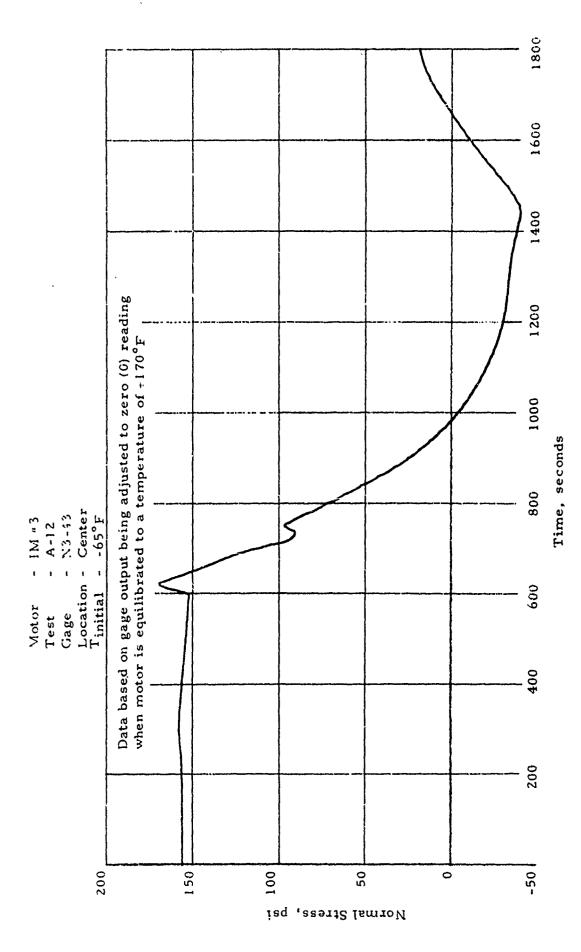
A-10 (SFPI)

- IM#3

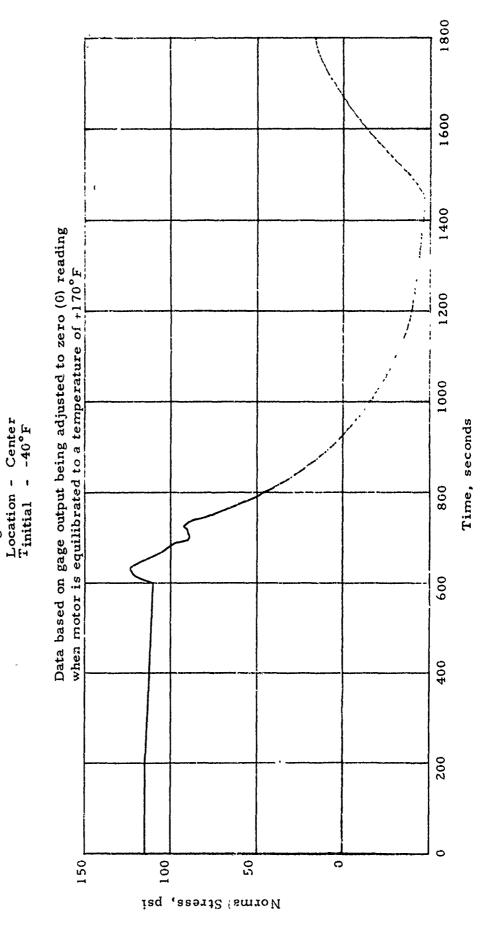
Motor

Test

Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43



Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43



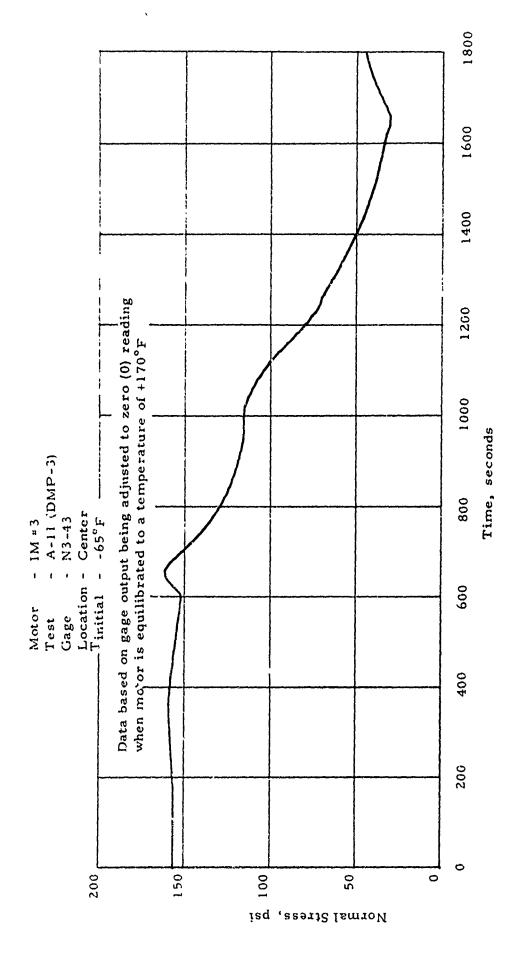
A9 (SFPI)

- 1M#3

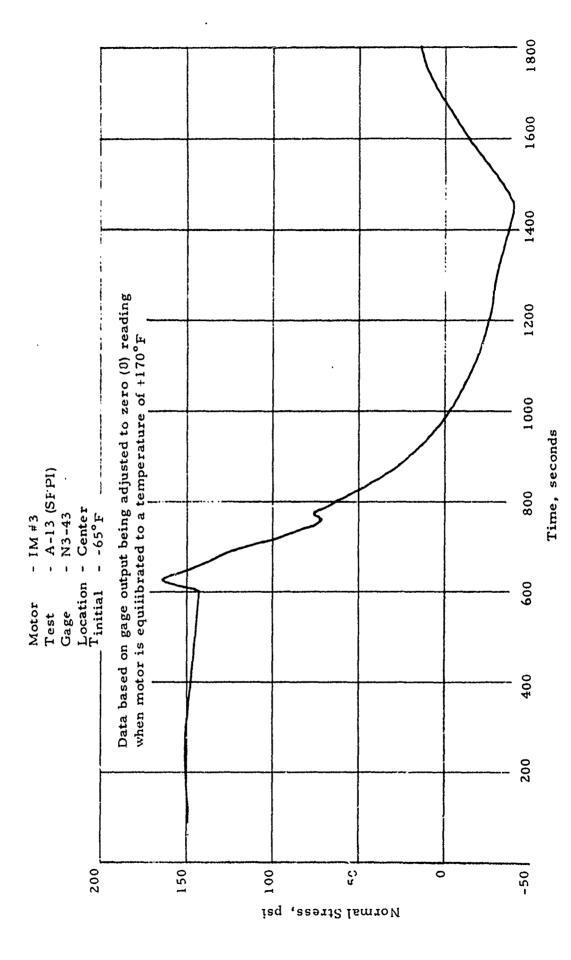
Motor Test Gage

N3-43

Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43

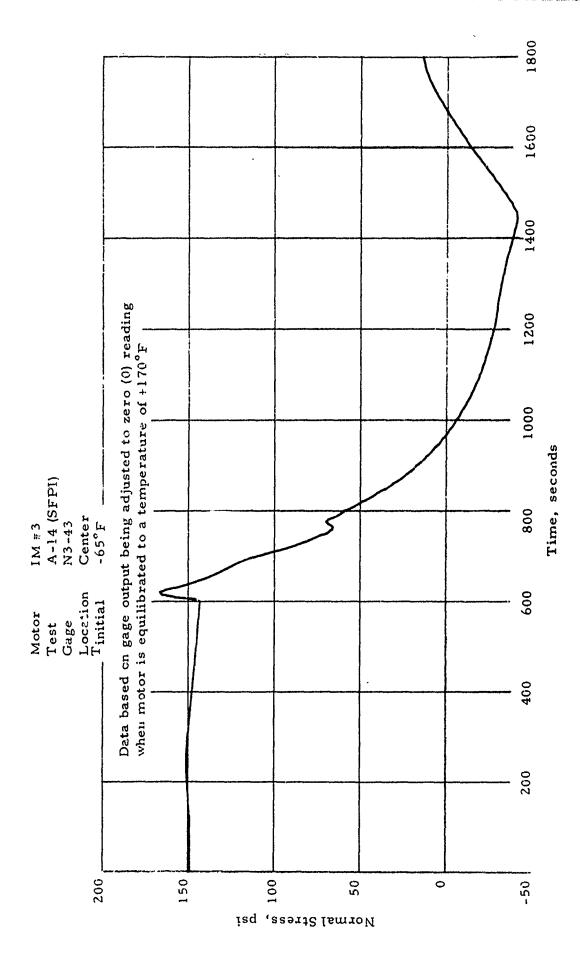


Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43



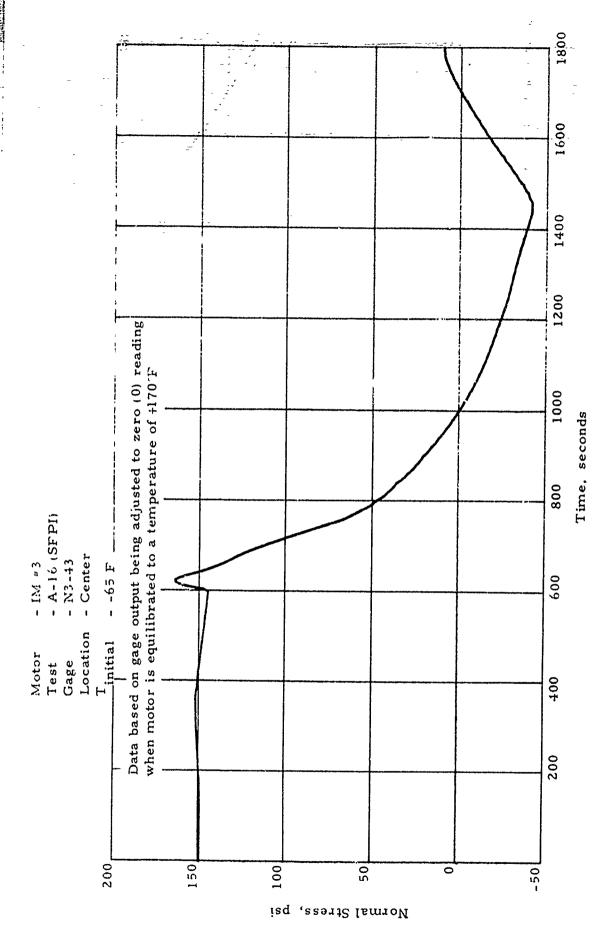
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Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43

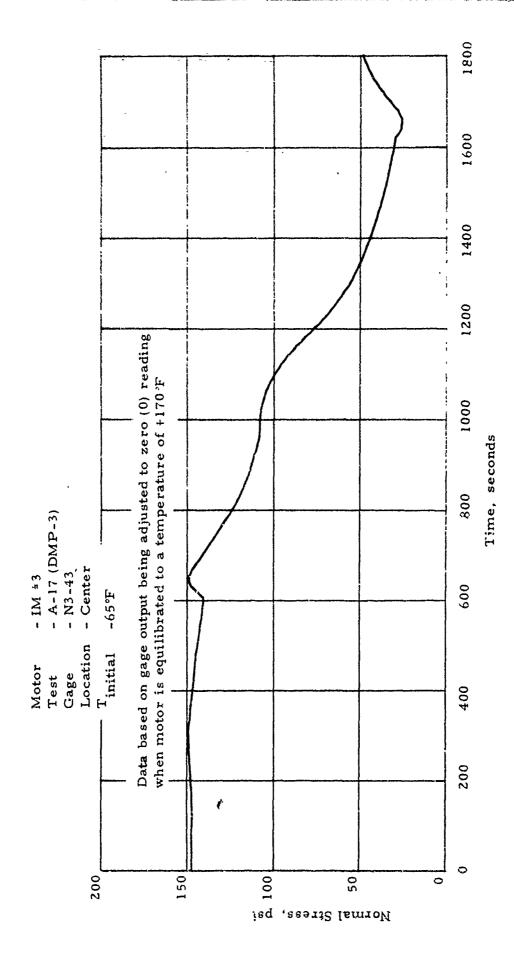


Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43

Mid-Motor Normal Stress Response to Aeroheat Loads .- Gage N3-43



Mid Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43



Mid-Motor Normal Stress Response to Aeroheat Loads -- Gage N3-43

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Motor - IM = 3

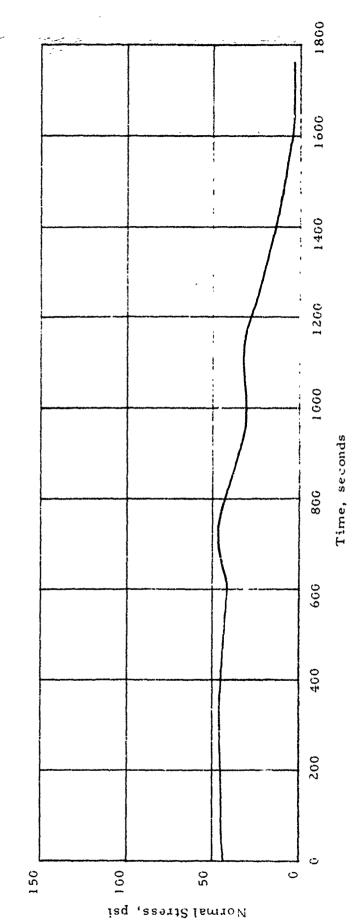
Test - Al (DMP-3)

Gage - N3-45

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} {\rm F}$



Aft End Normal Stress Response to Aeroheat Loads--Gage N3-45

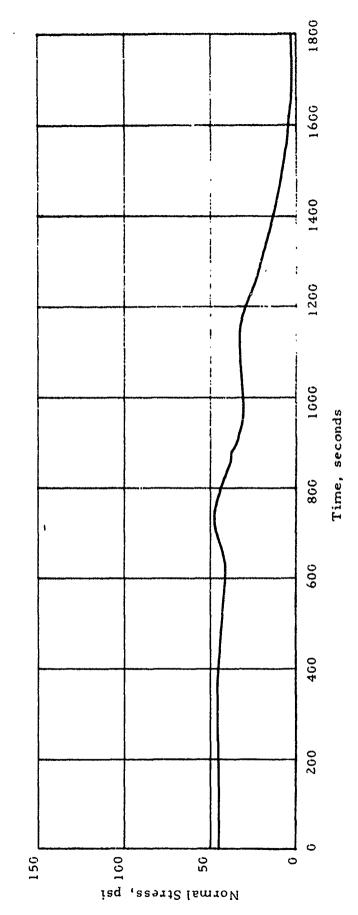
Motor - IM #3 Test - A2 (DMP-3) Gage - N3-45 Location - Aft Tinitial - -65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} {\rm F}$



Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - !M # 3

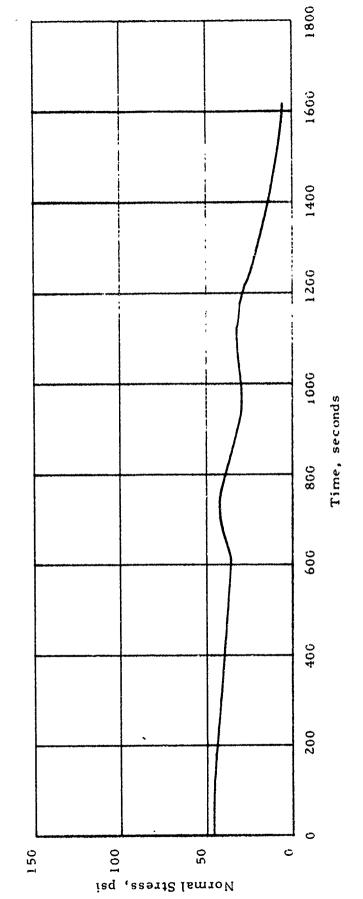
Test - A3 (DMP-3)

Gage - N3-45

Location - Aft

Tinitial - -65°F

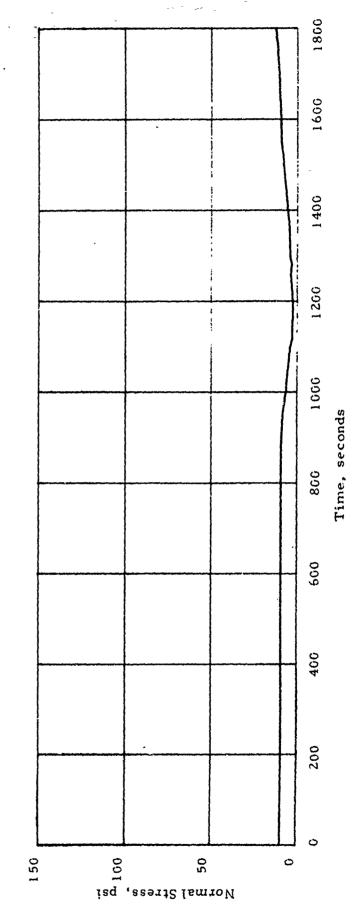
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Aft End "ormal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM #3
Test - A4 (HSMH)
Gage - N3-45
Location - Aft
Tinitial - 55°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$



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Aft End Normal Stries Response to Aeroheat Loads -- Gage N3-45

Mctor - IM #3

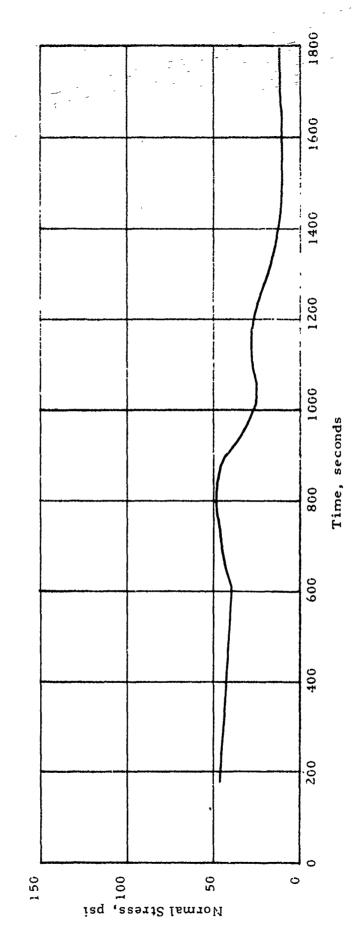
set - A5 (HSMH)

Cage - N3-45

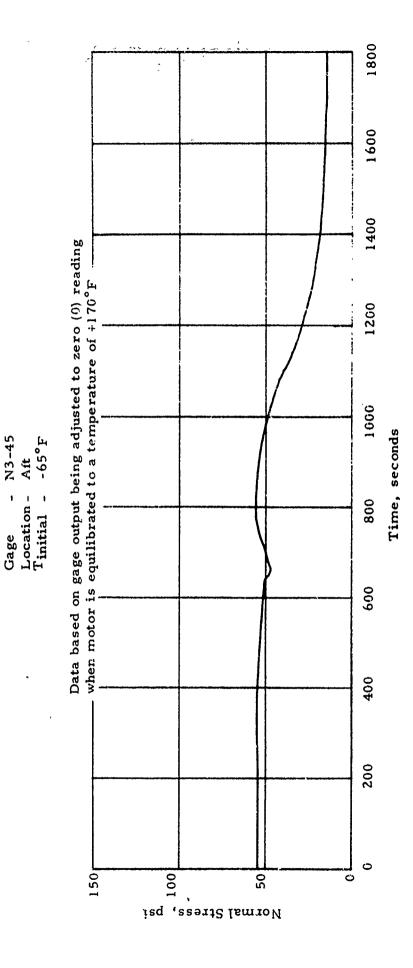
Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of +170°F



Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45



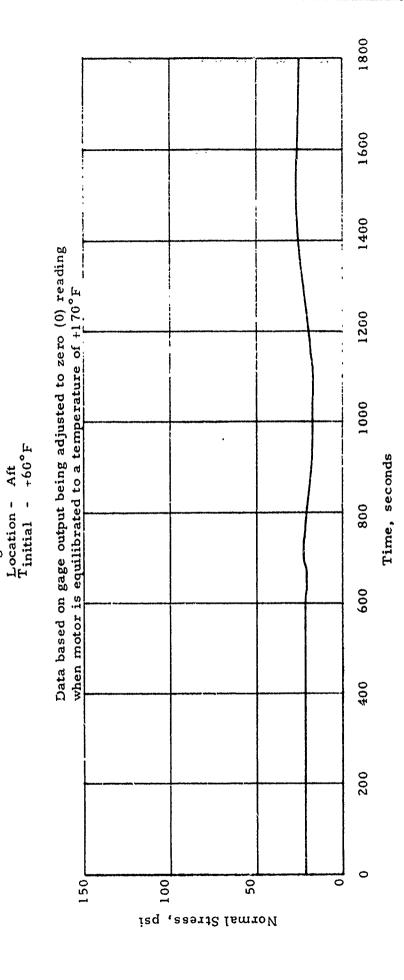
A6 (FISMH)

1M #3

Motor Test

N3-45

Aft End Normal Stress Response to Aeroheat Loads--Gage N3-45



A7 (SFPI) N3-45

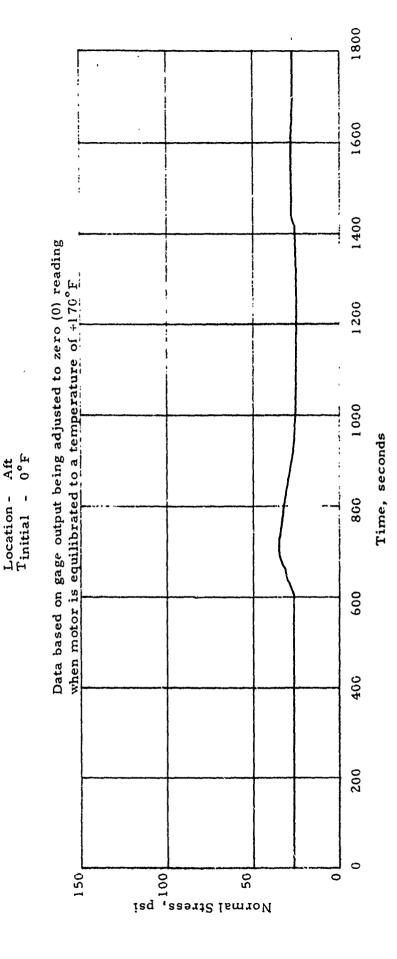
Aft

Gage Test

IM #3

Motor

Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45



A8 (SFPI)

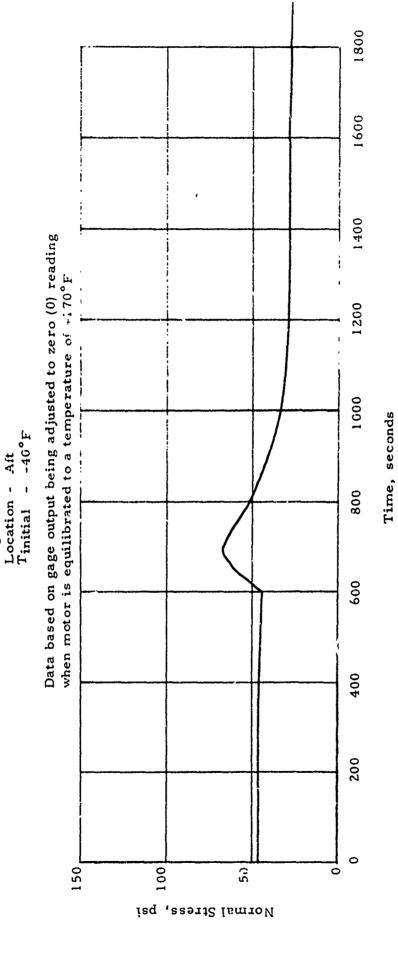
- IM = 3

Motor Test Gage

N3-45

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Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45



A9 (SFPI) N3-45

Test Gage

- 4M = 3

Motor

Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM #3

Test - A-10 (SFPI)

Gage - N3-45

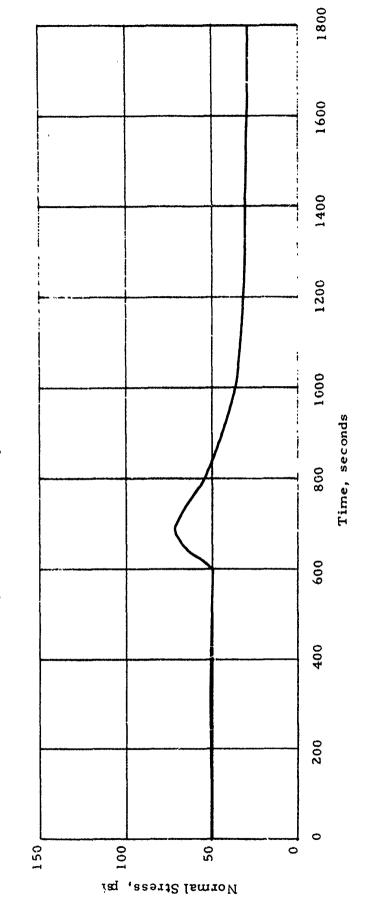
Location - Aft

Tinitial - -65°F

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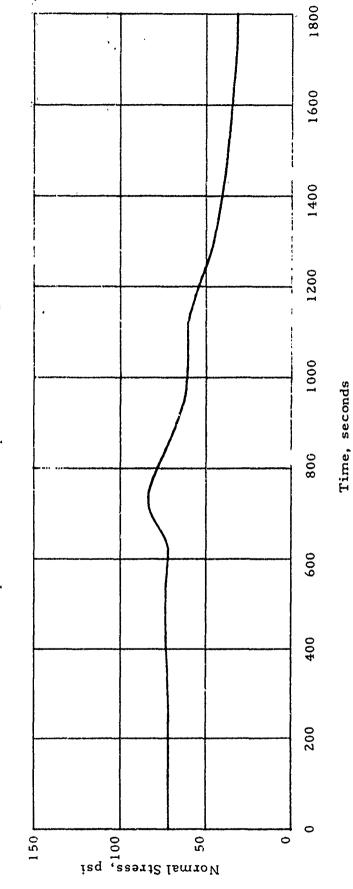
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM = 3
Test - A-11 (DMP-3,
Gage - N3-45
Location - Aft
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$



Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM #3

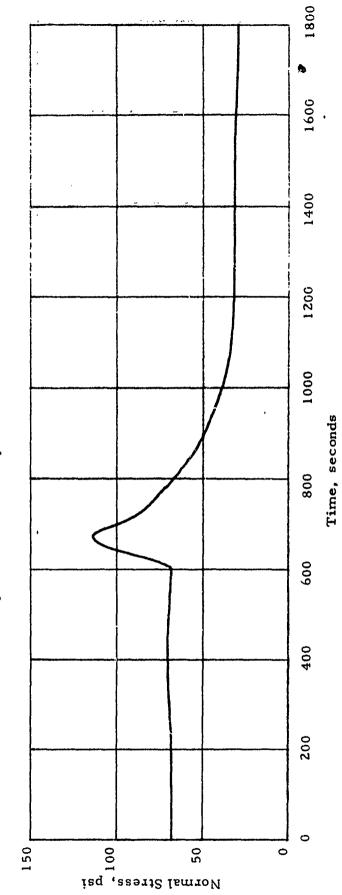
Test - A-12 (SFPI)

Gage - N3-45

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$



Aft End Normal Stress Response to Aeroheat Loads--Gage N3-45

Motor - IM #3

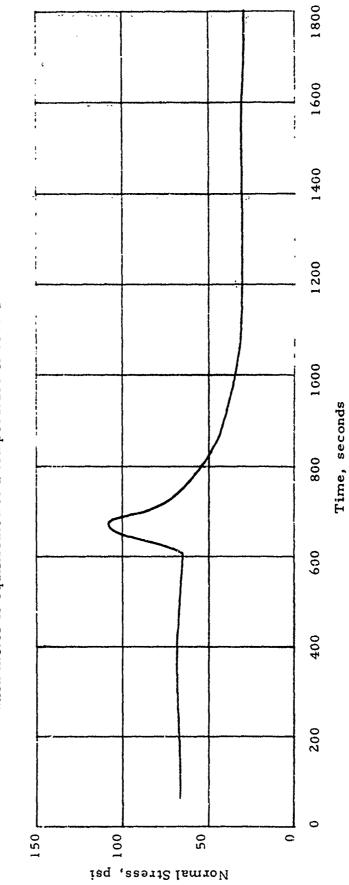
Test - A-13 (SFPI)

Gage - N3-45

Location - Aft

Tinitial - -65°F

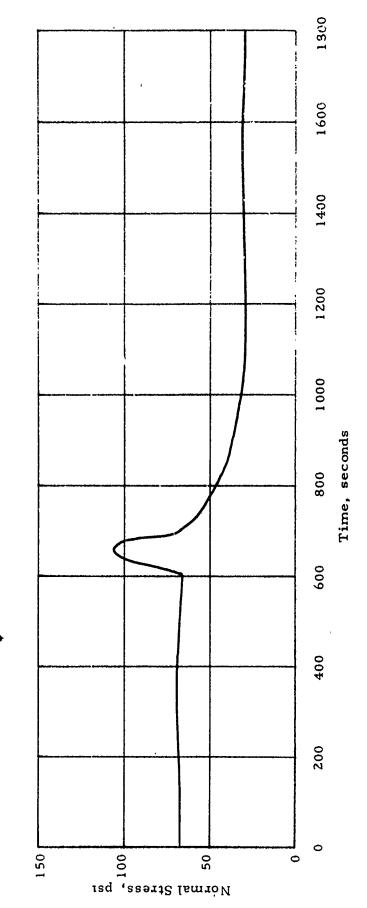
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



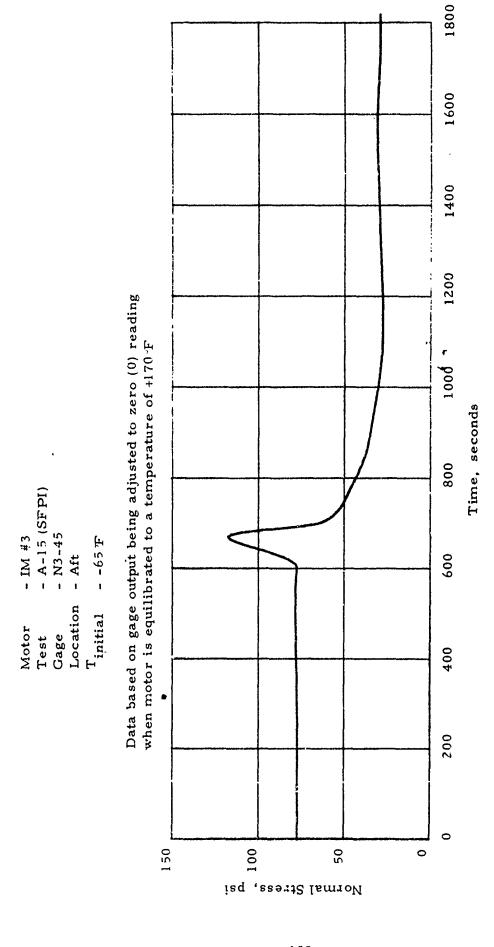
Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM #3
Test - A-14 (SFPI)
Gage - N3-45
Location - Aft
Tinitial - -65°F

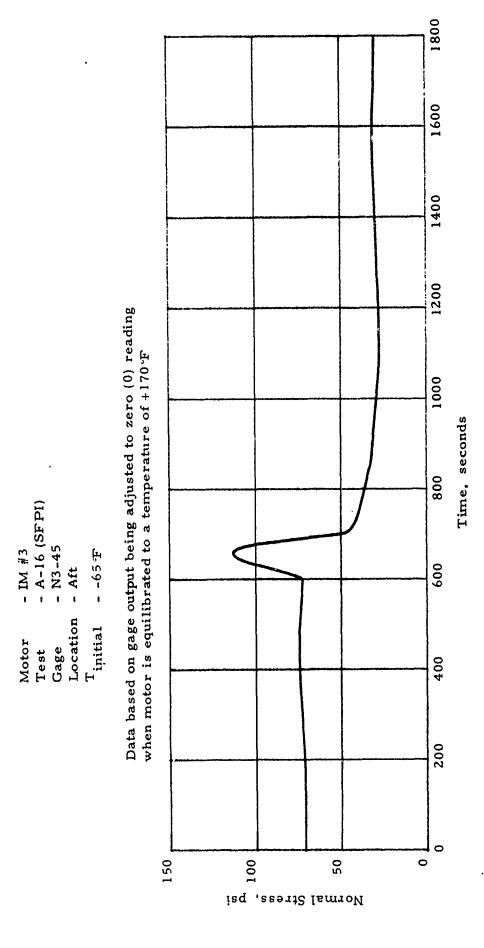
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45



Aft End Normal Stress Response to Aeroheat, Loads .- Gage N3-45



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Aft End Normal Stress Response to Aeroheat Loads -- Gage N3-45

Motor - IM #3

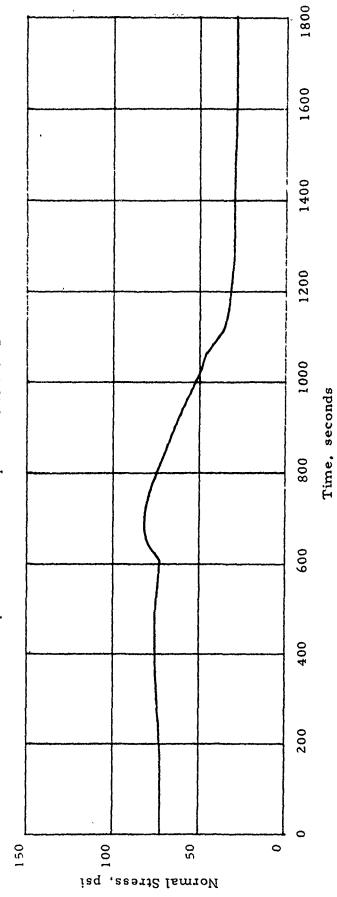
Test - A-17 (DMP.3)

Gage - N3-45

Location - Aft

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Aft End Normal Stress Response to Aercheat Loads -- Gage N3-45

Motor - IM #3

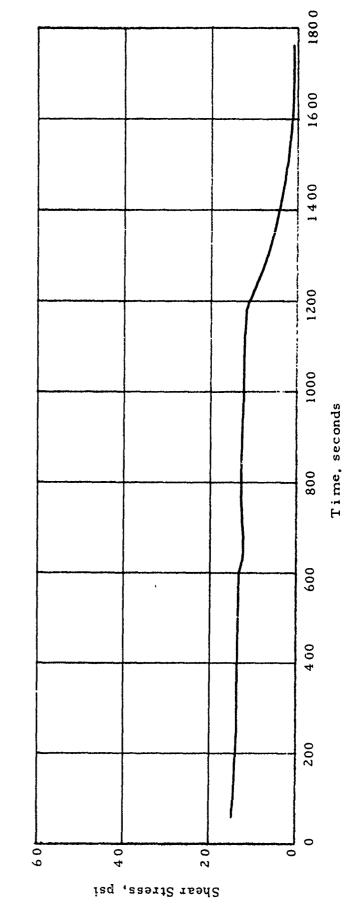
Test - Al (DMP-3)

Gage - S3-104

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motoris equilibrated to a temperature of +170'F



Head End Shear Stress Response to Aeroheat Loads -- Gage S3-164

Motor - IM #3

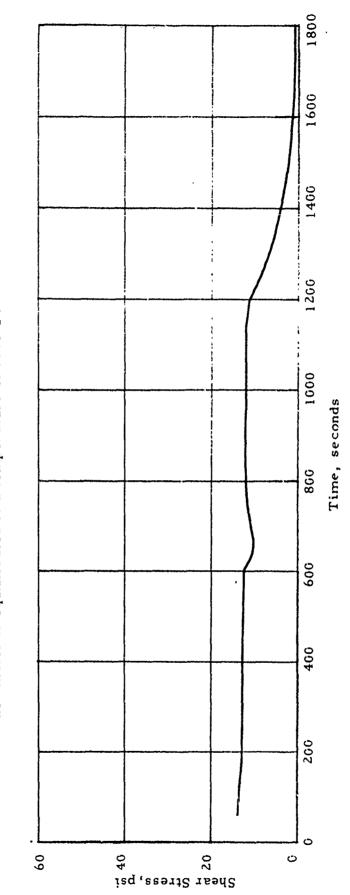
Test - A2 (DNP-3)

Gage - S3-164

Location - Fwd

initial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.

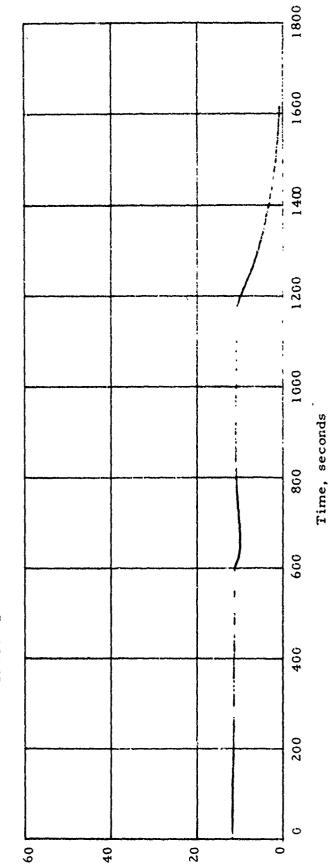


Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104

See .. Co

Motor - IM #3
Test - A3(DMP-3)
Gage - S3-164
Location - Fwd
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104

Shear Stress, psi

Motor - IM #3

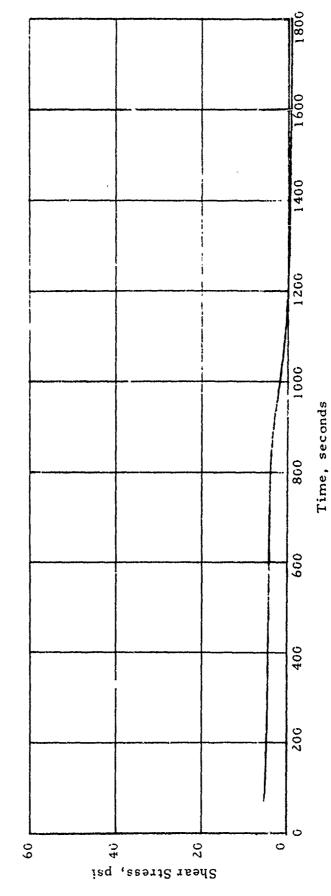
Test - A4 (HSMH)

Gage - S3-104

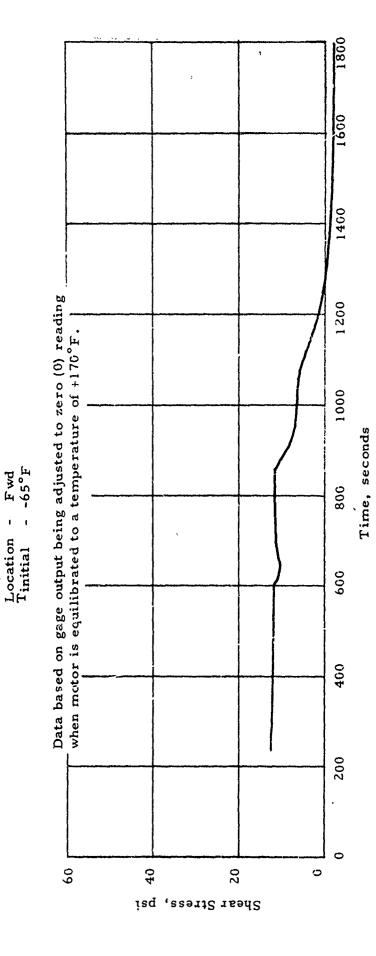
Location - Fwd

Tinitial - 55°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$.



Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



A5 (HSMH) S3-104

> Test Gage

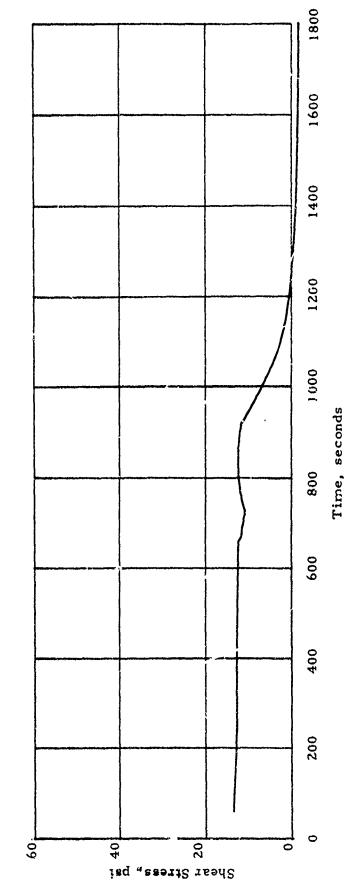
IM #3

Motor

Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104

Motor IM #3
Test A6 (HSMH)
Gage S3-104
Location Fwd
Tinitial -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.

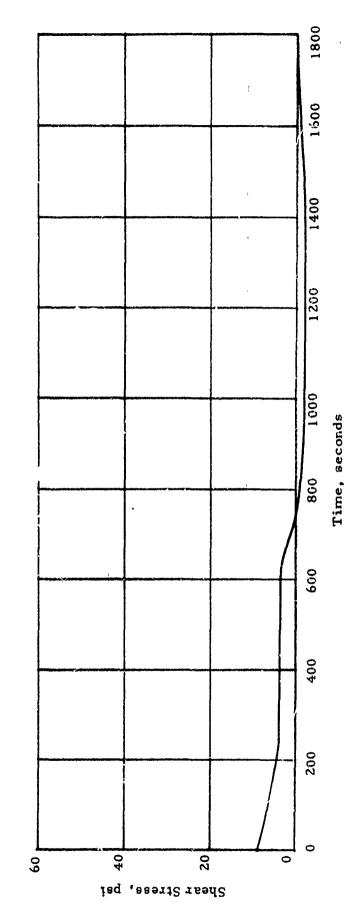


Head End Shear Stress Response to Agroheat Loads -- Cage S3-104

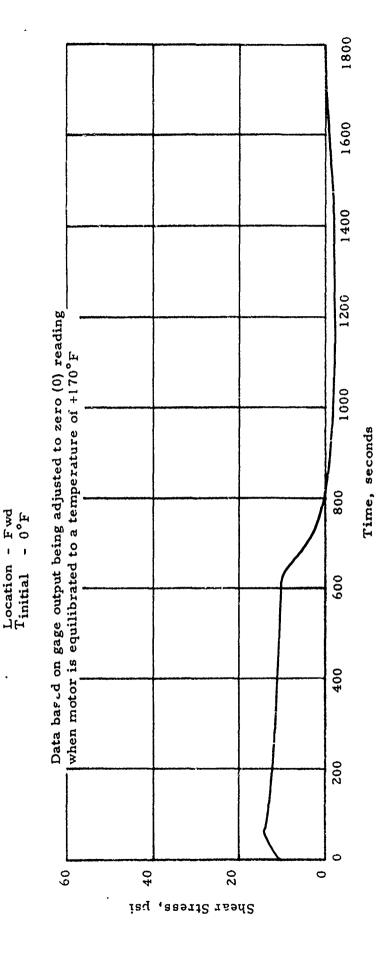
Motor IM#3
Test A7 (SFPI)
Gage S3~104
Location Fwd
Tinitial +60°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



- A8 (SFPI) - 53-104

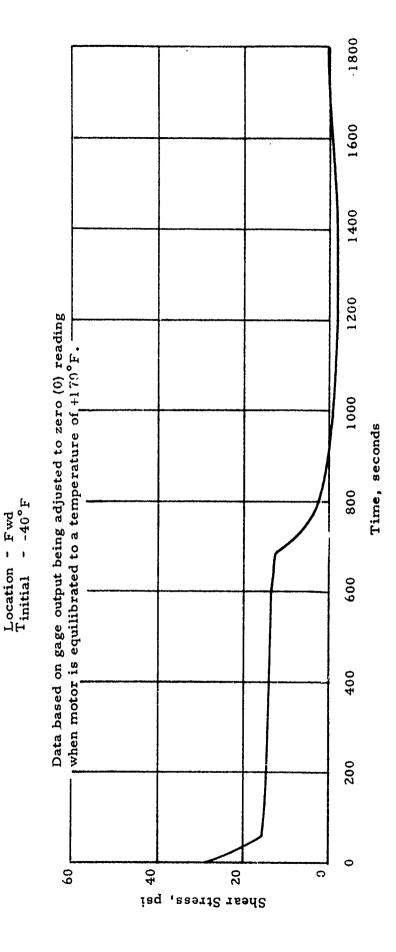
- Fwd

Gage Test

- IM#3

Motor

Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



- A9 (SFPI)

- IM#3

Motor

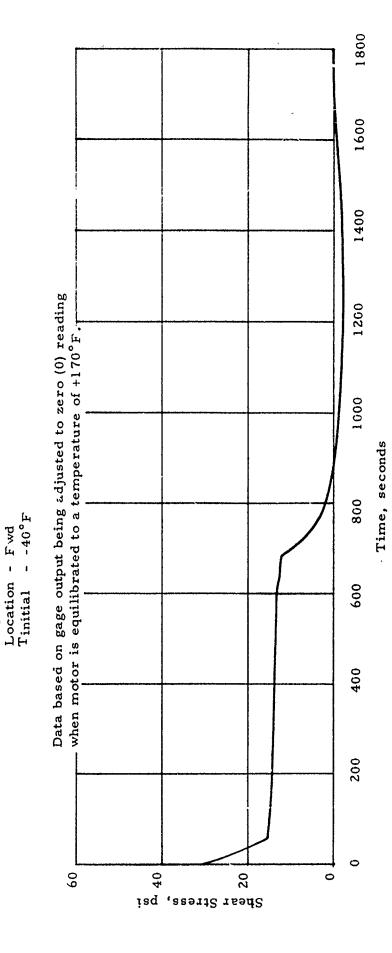
- S3-104

Gage Test

- Fwd

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Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



A10 (SFPI)

- IM #3

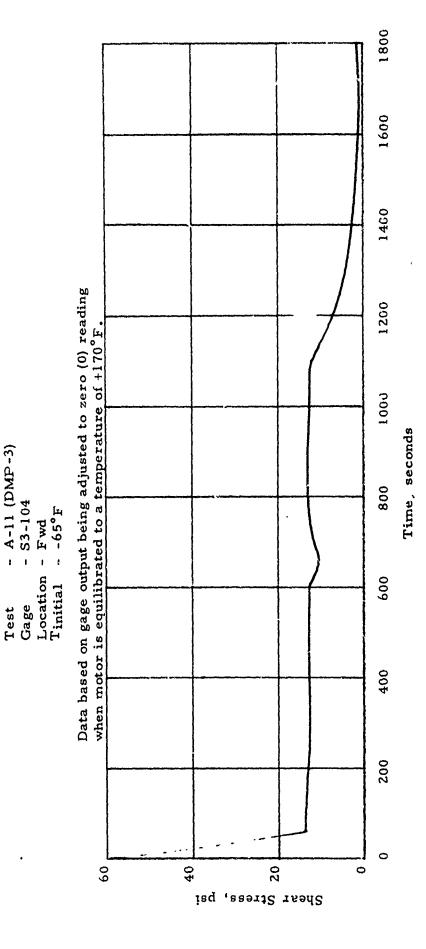
Motor

53-164

Gage Test

- Fwd

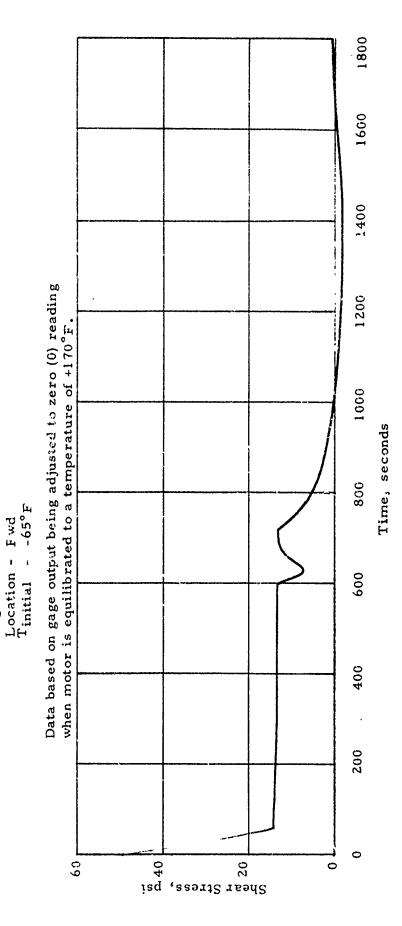
Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



- IM#3

Motor

Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



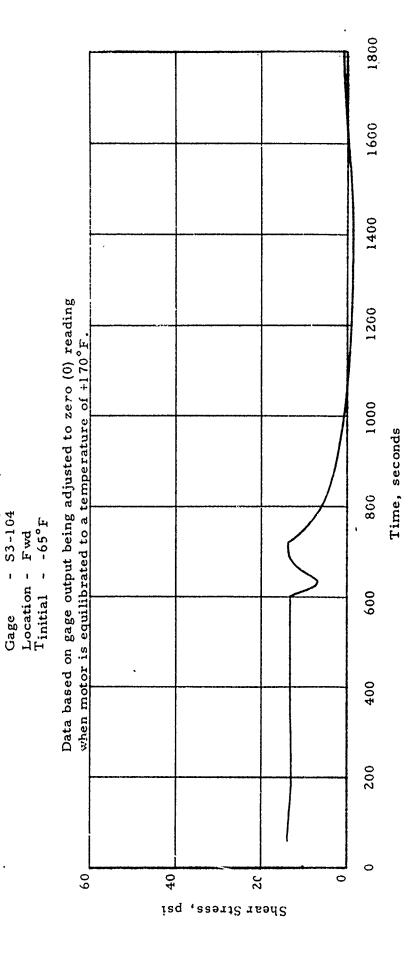
A-12 (SFPI)

- IM#3

Motor Test Gage

S3-104

Head End Shear Stress Response to Aeroheat Loads -- Gage S3-104



A-13 (SFPI)

- IM#3

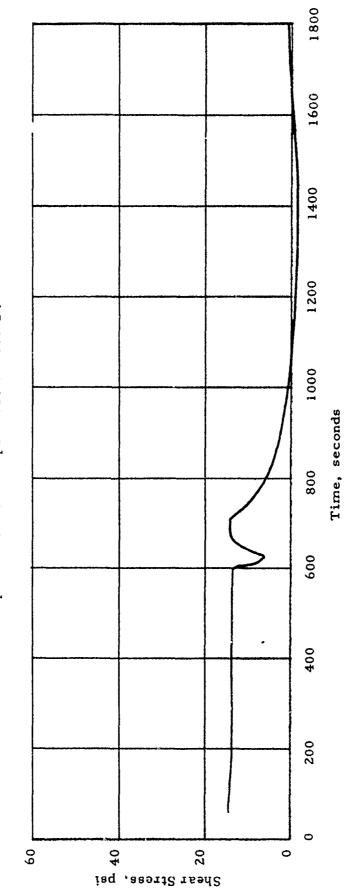
Motor Test

The State of the S

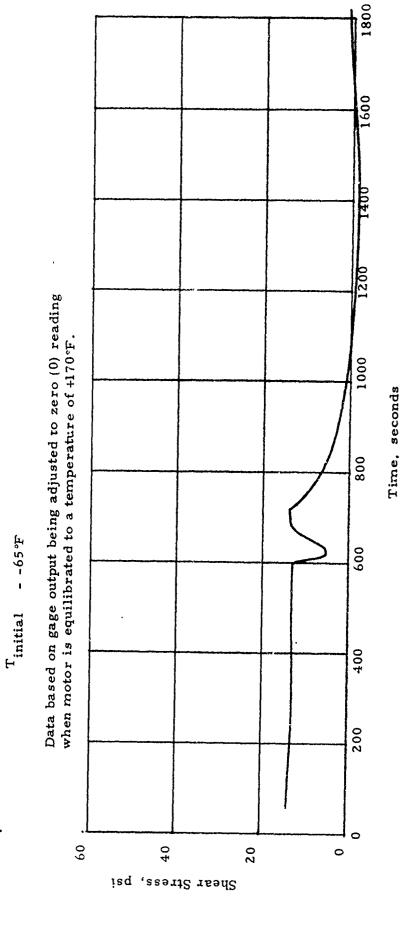
Head End Shear Stress Response to Aeroheat Load -- Gage S3-104

Motor - IM-3
Test - A-14 (SFPI)
Gage - S3-104
Location - Fwd
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature c'il70°F.



Head End Shear Stress Response to Aeroheat Load .- Gage S3-104



Head End Shear Stress Response to Aeroheat Load--Gage S3-104

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The contract that a section to the section of

- A-15 (SFPI) - S3-104

- Fwd

Location

Test Gage

- IM #3

Motor

172

Motor - IM #3

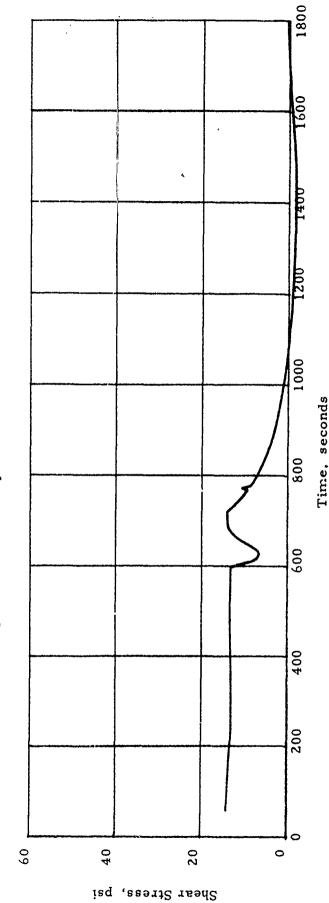
Test - A-16 (SFPI)

Gage - S3-104

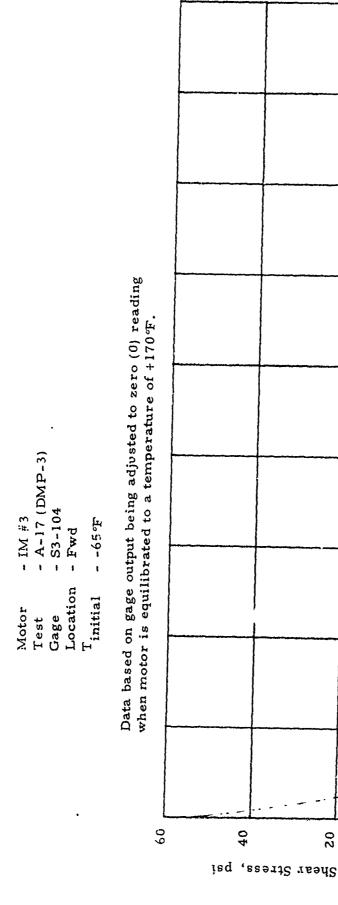
Location - Fwd

Tinitial - -65-F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Head End Shear Stress Response to Aeroheat Load--Gage S3-104



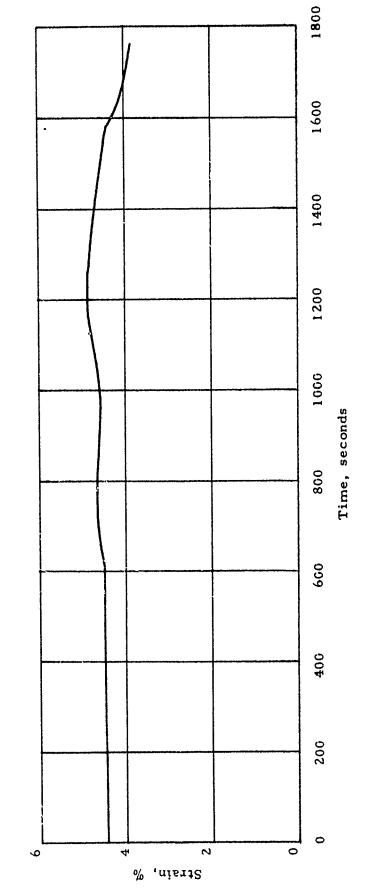
1. Designation

Head End Shear Stress Response to Aeroheat Load .- Gage S3-104

Time, seconds

Motor - IM #3
Test - A-1 (DMP-3)
Gage - C3-18
Location - Fwd
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} {\rm F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - 1M #3

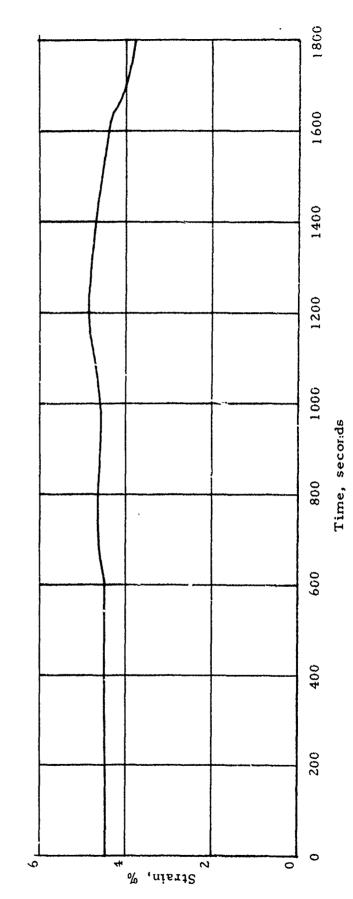
Test - A2 (DMP-3)

Gage - C3-18

Location - Fwd

Tinitial - -65°F

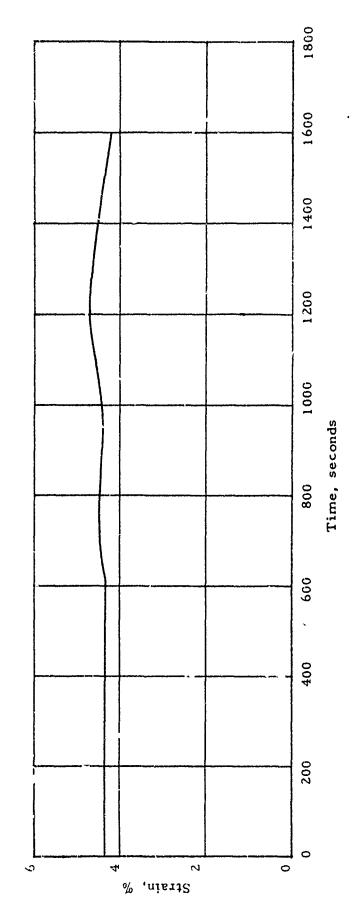
Data based on gage output being adjusted to zero (3) reading when motor is equilibrated to a temperature of +170°F



Bore Strain Response to Aeroheat Londs -- Gage C3-18

Motor - IM #3
Test - A3 (DMP-3)
Gage - C3-18
Location - % wd
Tinitial - -b; °F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of 170°F



Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - IM #3

Test - A4 (HSMH)

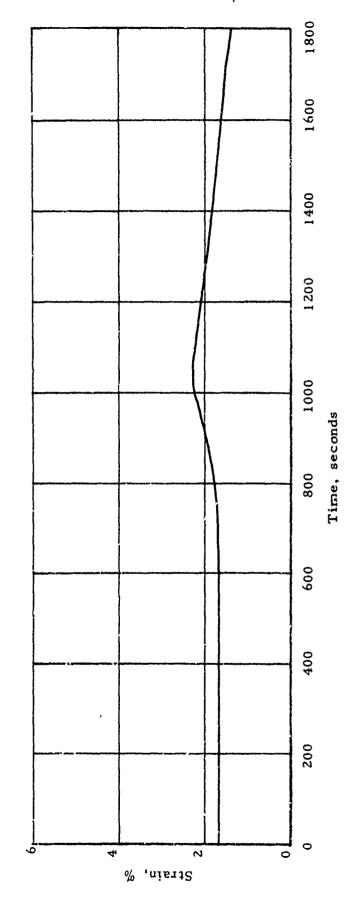
Gage - C3-18

Location - Fwd

Tinitial - 55°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - IM #3

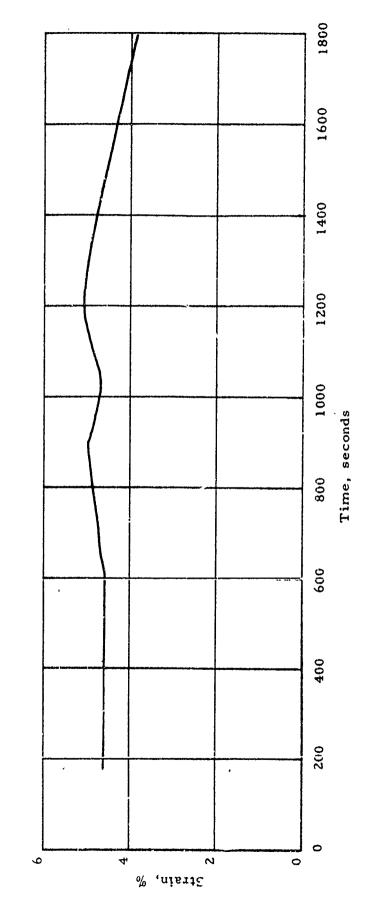
Test - A5 (HSMH)

Gage - C3-18

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - IM #3

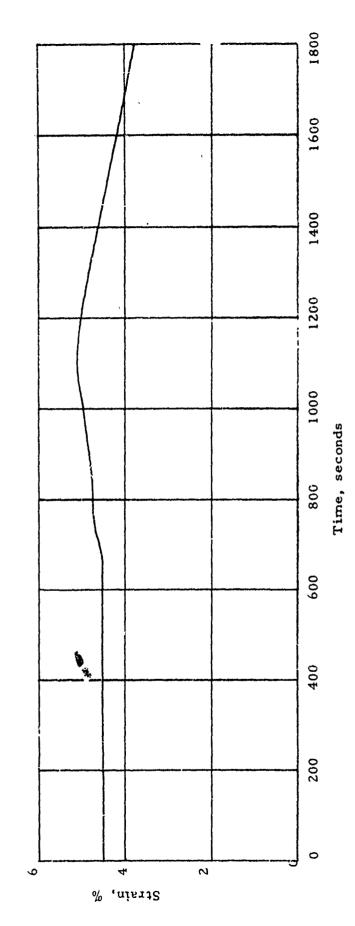
Test - A6 (HSMH)

Gage - C3-18

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$



Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - IM #3

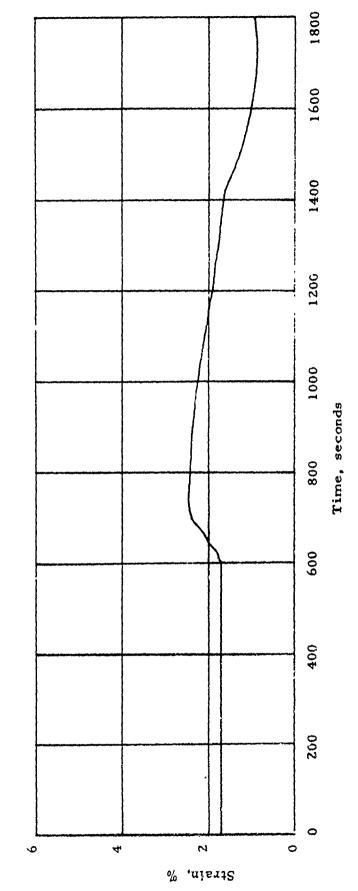
Test - A7 (SFPI)

Gage - C3-18

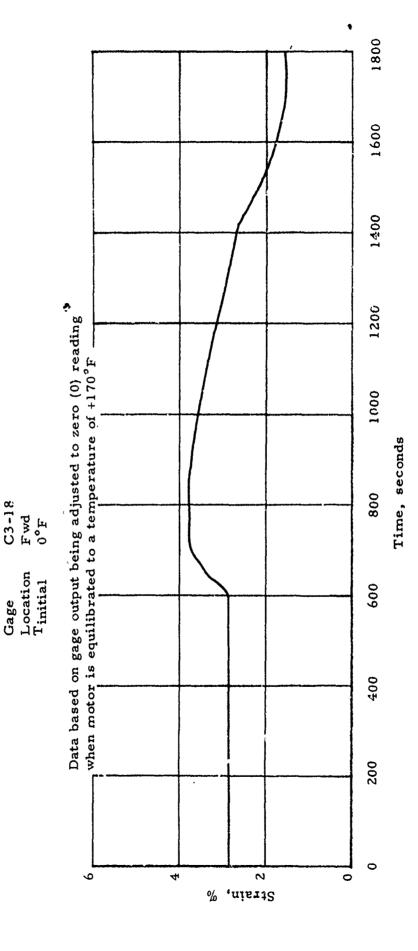
Location - Fwd

Tinitial - +60%

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$



Bore Strain Response to Aeroheat Loads -- Gage C3-18



A8 (SFPI)

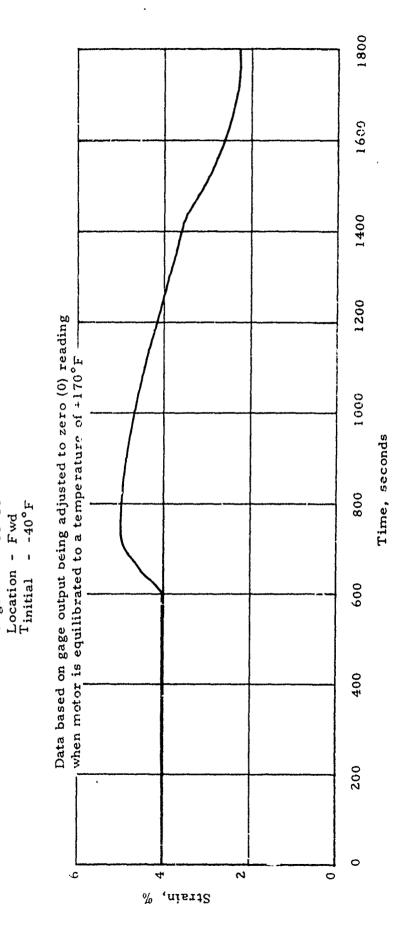
IM#3

Motor

Test

C3-18

Bore Strain Response to Aeroheat Loads .- Gage C3-18



- A9 (SFPI)

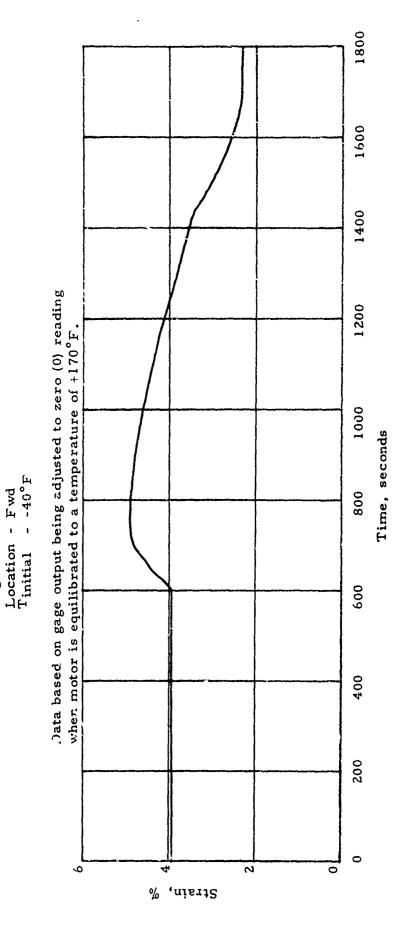
- IM #3

Motor Test Gage

C3-18

Fwd

Bore Strain Response to Aeroheat Loads -- Gage C3-18



- A-10 (SFPI)

C3-18

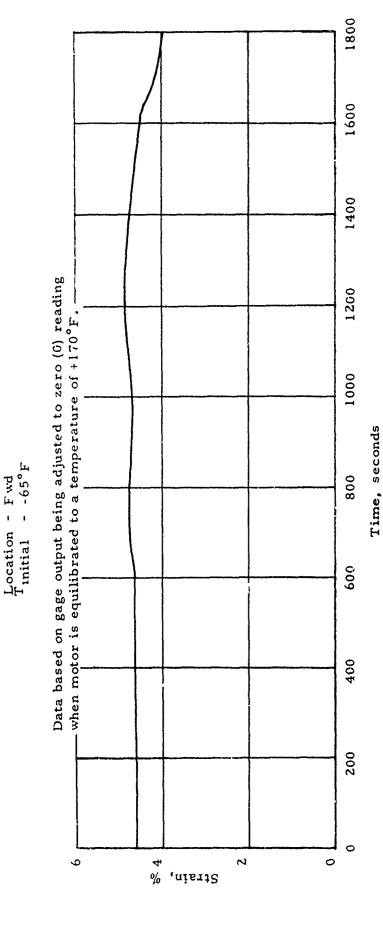
- Fwd

- IM#3.

Motor Test Gage

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Bore Strain Response to Aeroheat Loads--Gage C3-18



- A-11 (DMP-3)

- IM#3

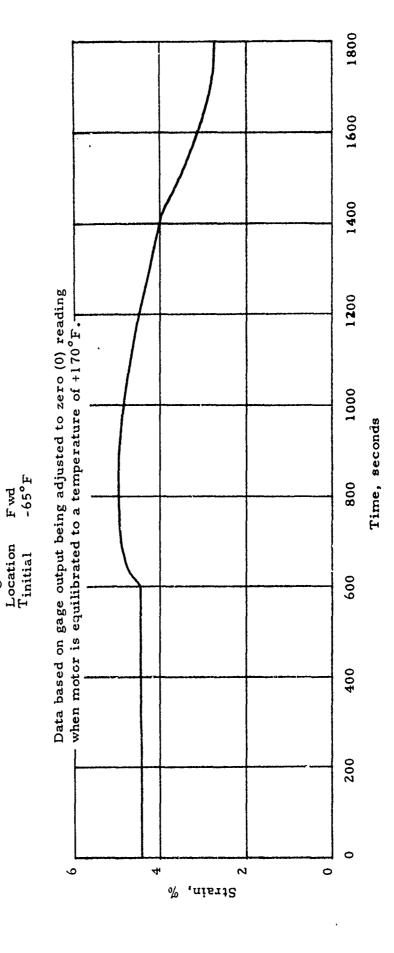
Motor

- C3-18

Gage Test

- Fwd

Bore Strain Response to Aeroheat Loads -- Gage C3-18



the " had have of a single man property of his " has a hand " . I have

A-12 (SFPI)

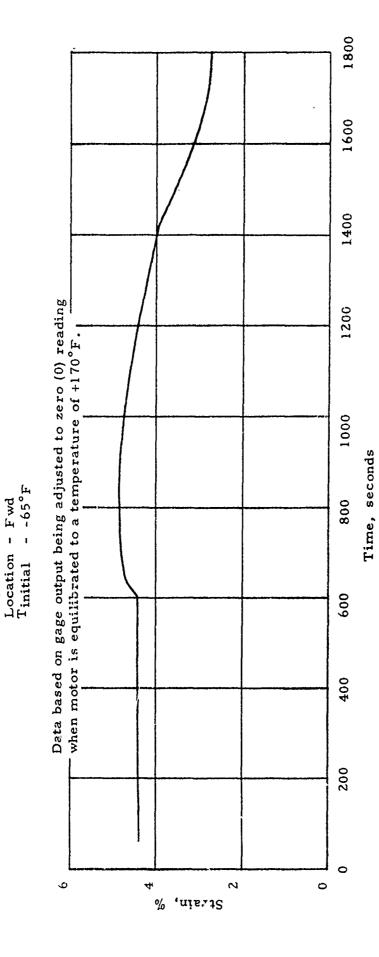
IM #3

Motor

C3-18

Gage Test

F wd



- A-13 (SFPI)

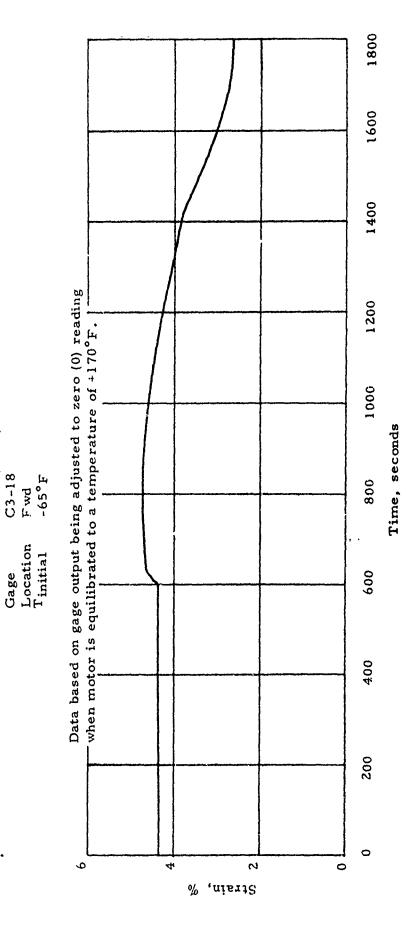
- IM #3

Motor Test Gage

- C3-18

- Fwd

Bore Strain Response to Aeroheat Loads -- Gage C3-18



A-14 (SFPI) IM #3

> Motor Test

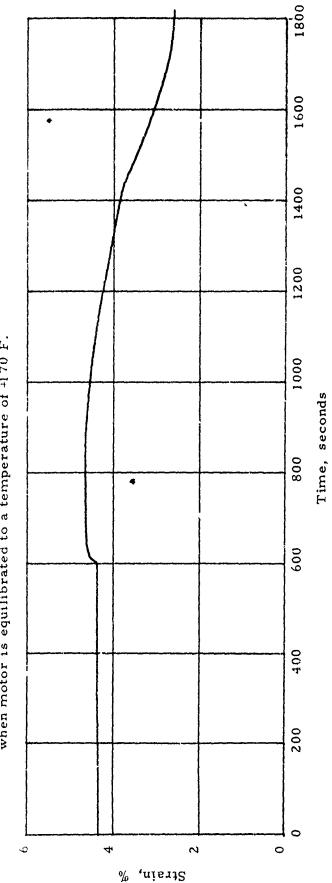
C3-18

Fwd

Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor Man Test A-15 • Gage C3-16 Location Fwd Tinitial -65'F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170~F$.

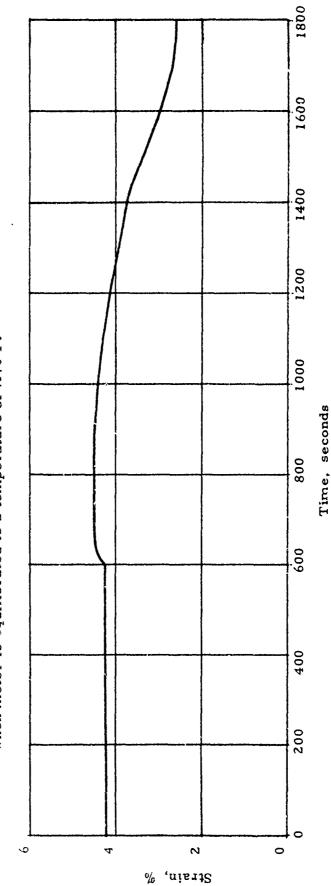


Bore Strain Response to Aeroheat Loads -- Gage C3-18

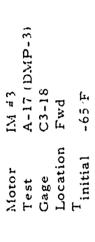
Motor IM #3
Test A.16 (SFPI)
Gage C3-18
Location Fwd
Tinitial -65*F

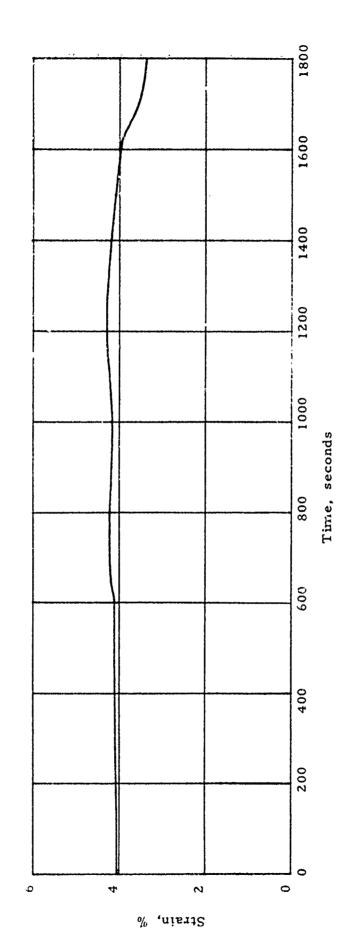
The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Bore Strain Response to Aeroheat Loads -- Gage C3-18





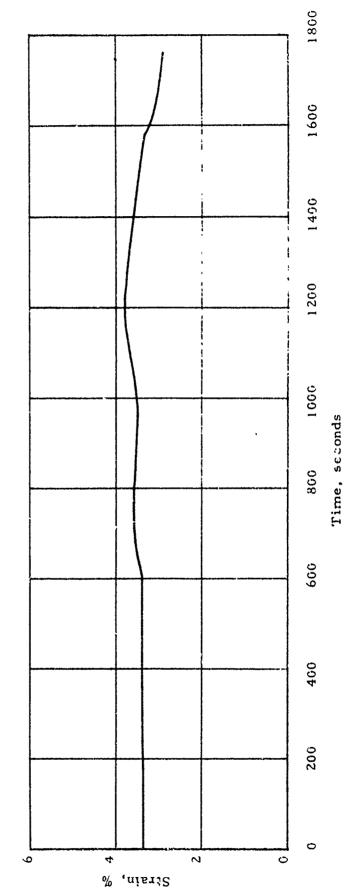
Bore Strain Response to Aeroheat Loads -- Gage C3-18

Motor - 1M = 3Test - A-1 (DMP-3) Gage - C3-19 Location - Aft (small bore) Tinitial - -65°F

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Control of the second s

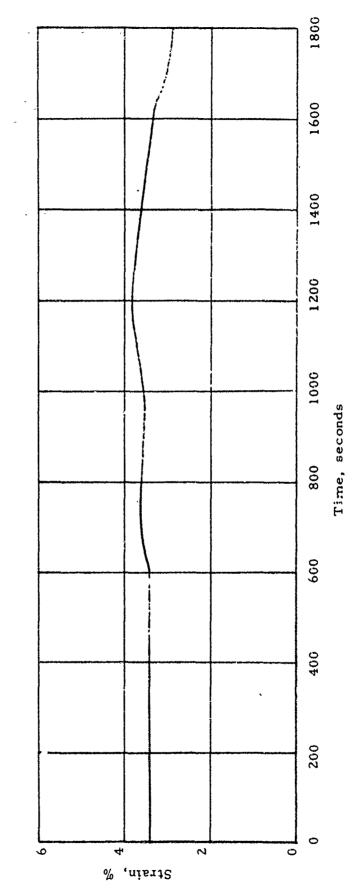
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 176^{\circ}F$



Bore Strain Response to Aeroheat Loads -- Gage C3-19

Motor - IM #3
Test - A2 (DMP-3)
Gage - G3-19
Location - Aft (small bore)
Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$

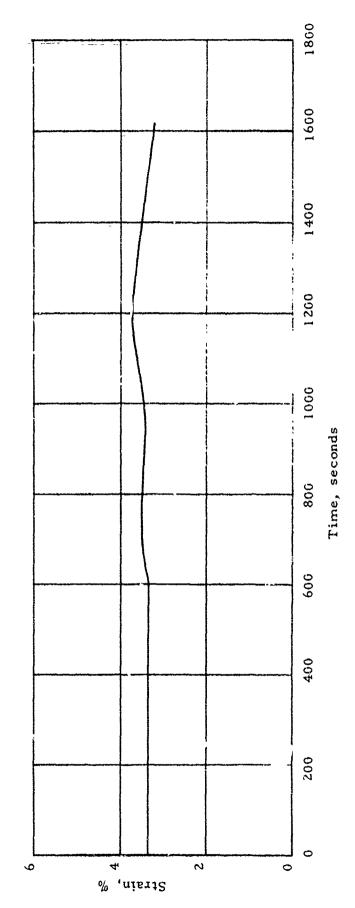


Bore Strain Kesponse to Aeroheat Loads -- Gage C3-19

- Aft (small bore) - -65°F A3 (DM?-3) 53-19 - ;M#3 Location Tinitial Motor Test Gage

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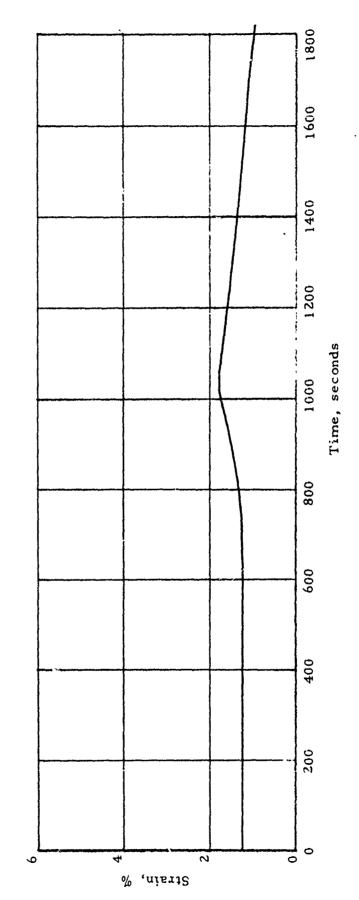
Daia based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} \mathrm{F}$



Bore Strain Response to Aercheat Load -- Gage C3-19

Motor - $1M \pm 3$ Test - A4 (HSMH)
Gage - C3-19
Location - Aft (small bore)
Tinitial - 55°F

Data based on gage output being adjusted to zero (6) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} {\rm F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-19

Motor - IM #3

Test - A5 (DMP-3)

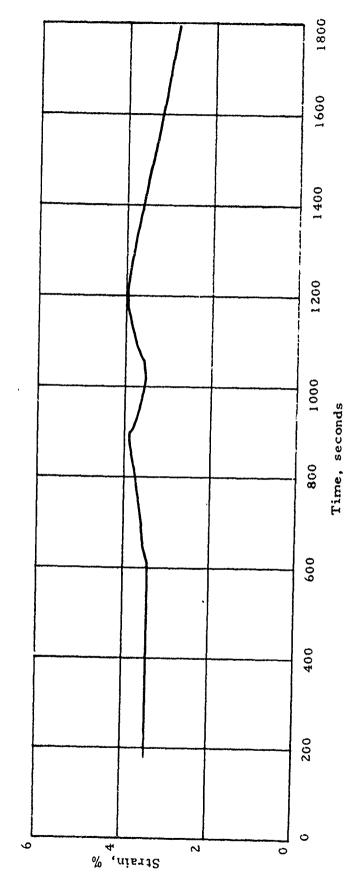
Gage - C3-19

Location - Aft (small bore)

Tinitial - -65°F

W. Comments

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads ... Gage C3-19

Motor - IM #3

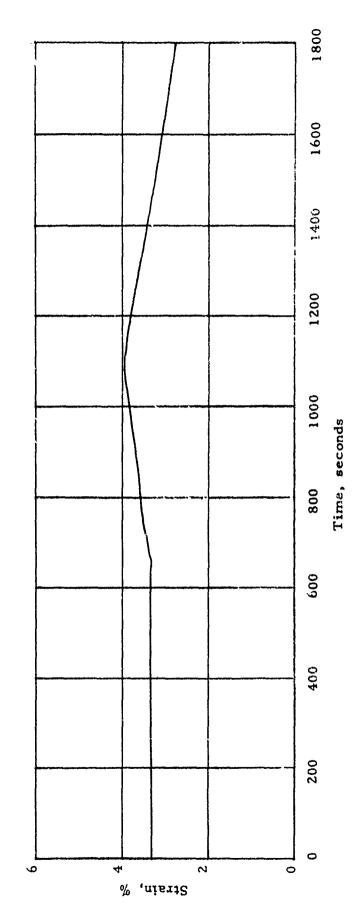
Test - A6 (HSMH)

Gage - C3-19

Location - Aft (small bore)

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.

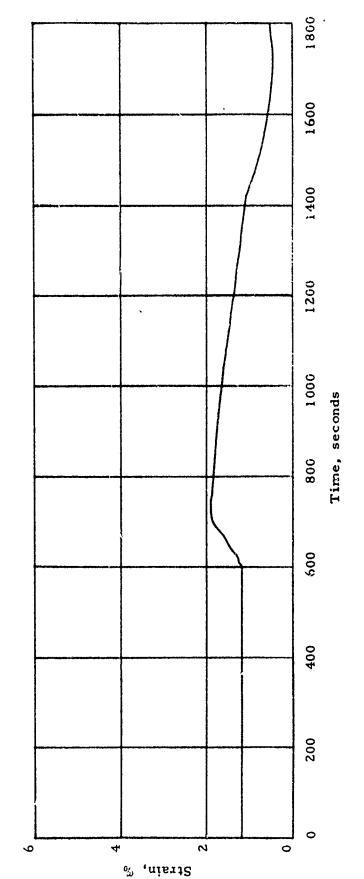


Bore Strain Response to Aeroheat Loads -- Gage C3-19

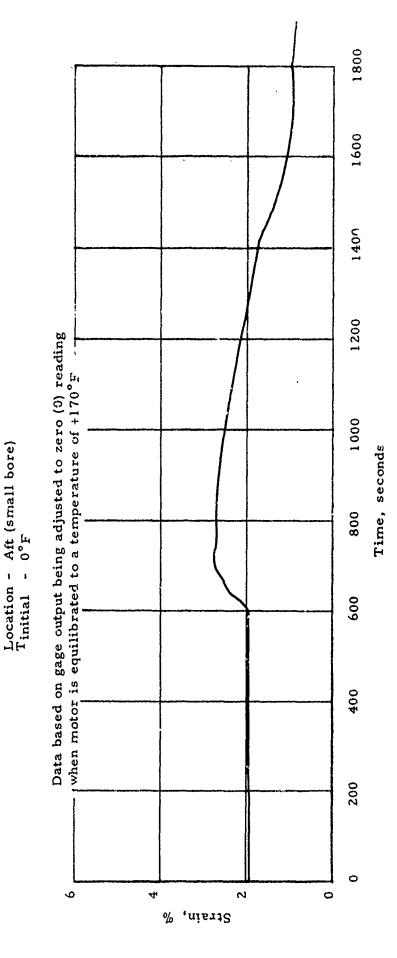
Motor - IM #3
Test - A7 (SFPI)
Gage - C3-19
Location - Aft (small bore)
Tinitial - +60°F

教教をいるはなると、これは我にといるとう! 松いまかままちょうないかいかい

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ} F$.



Bore Strain Response to Aeroheat Loads -- Gage C3-19



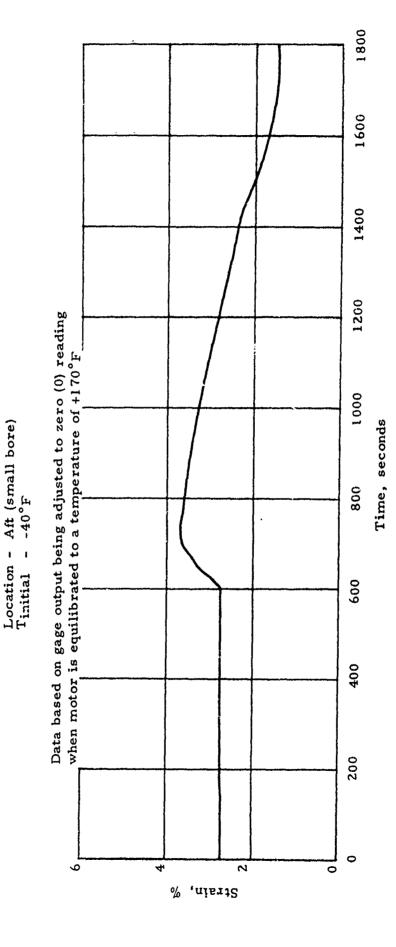
A8 (SFPI)

C3-19

- IM#3

Motor Test Gage

Bore Strain Response to Aeroheat Loads -- Gage C3-19



A9 (SFPI)

- IM#3

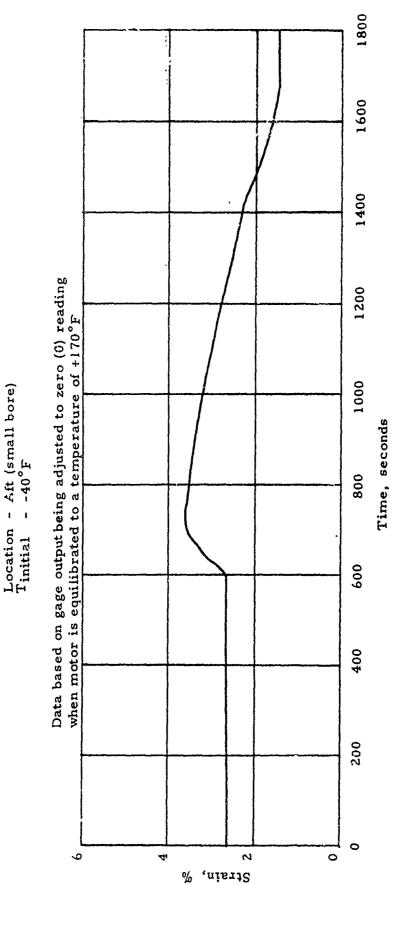
Motor Test Gage

C3-19

and Allertan

Bore Strain Response to Aeroheat Loads -- Gage C3-19

The state of the s



- Aft (small bore)

- A10 (SFPI) - IM#3.

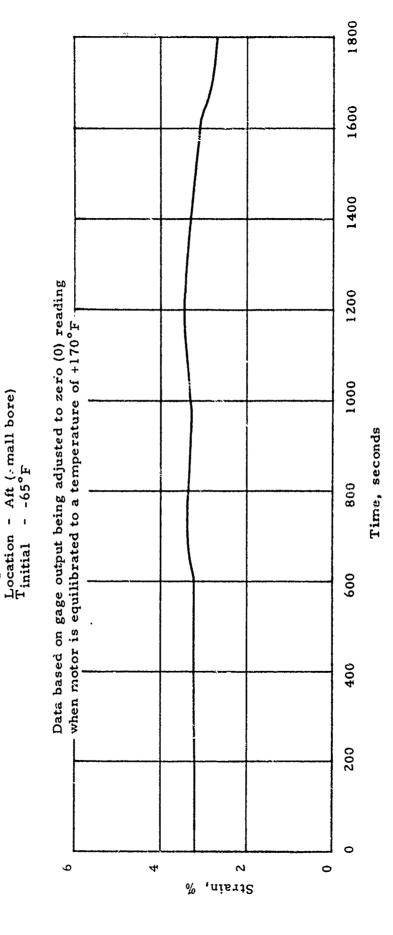
Motor

The same of the sa

- C3-19

Gage Test

Bore Strain Response to Aeroheat Loads -- Gage C3-19



- A-11 (DMP-3)

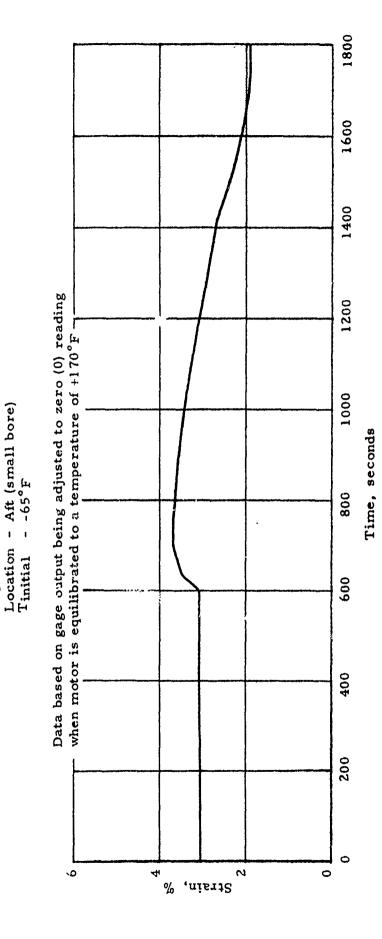
- C3-19

Test Gage

- IM#3

Motor

Bore Strain Response to Aeroheat Loads -- Gage C3-19



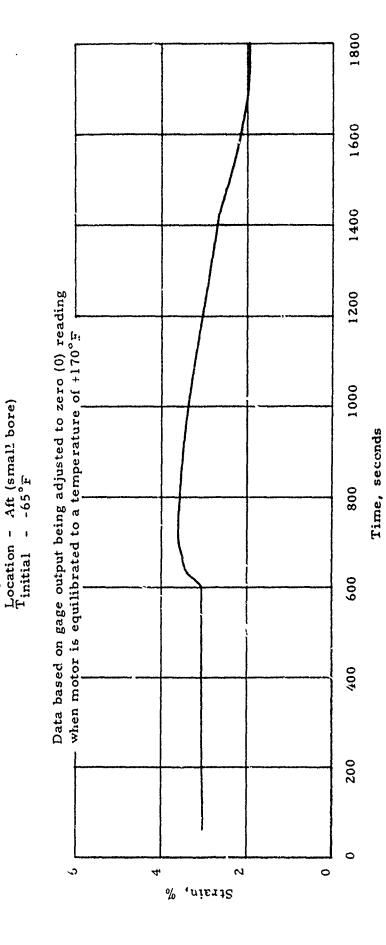
- IM#3 -- A-12 (SFPI)

Motor

- C3-19

Test Gage

Bore Strain Response to Aeroheat Loads -- Gage C3-19



A-13 (SFPI)

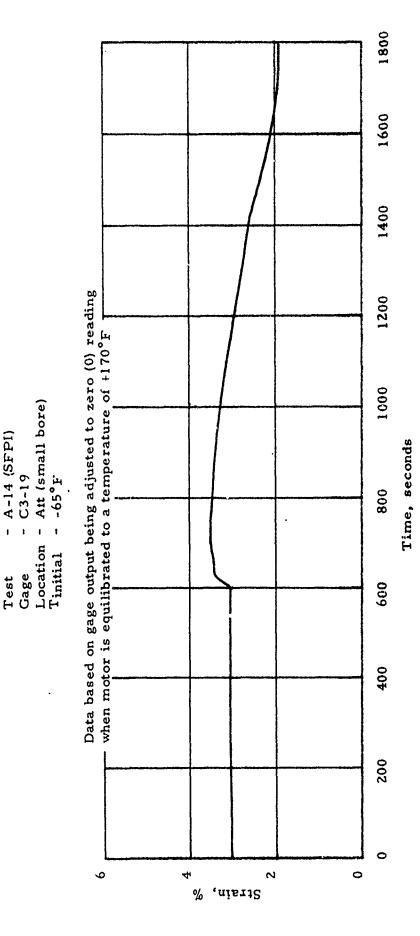
C3-19

Test Gage

- IM#3.

Motor

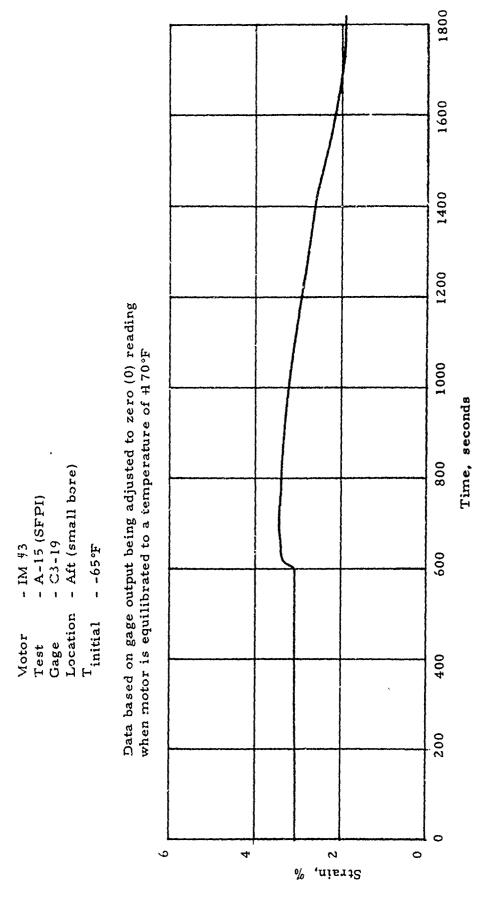
Bore Strain Response to Aeroheat Loads -- Gage C3-19



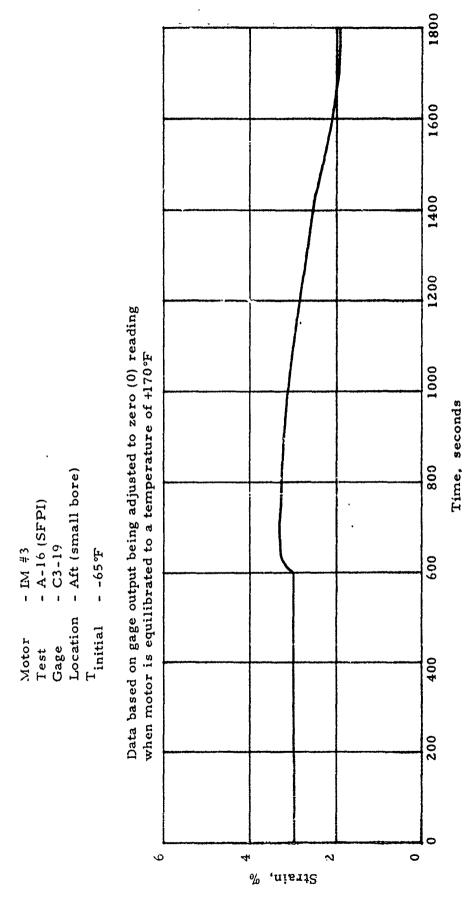
- IM#3

Motor

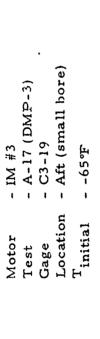
Bore Strain Response to Aeroheat Loads -- Gage C3-19



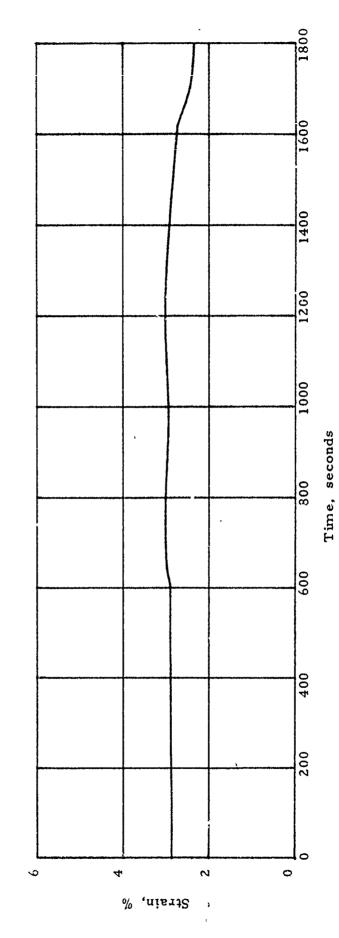
Bore Strain Response to Aeroheat Loads -- Gage C3-19



Bore Strain Response to Aeroheat Loads -- Gage C3-19



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Bore Strain Response to Aeroheat Loads -- Gage C3-19

Motor - 1M #3

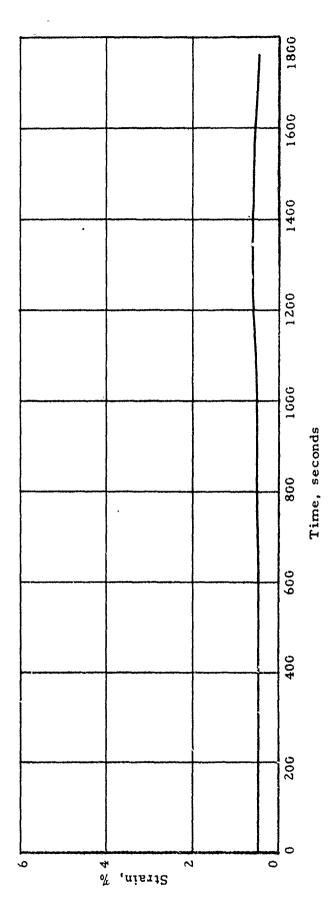
Test - A-1 (DMP-3)

Gage - C3-26

Location - Aft

Tinitial - 65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - 1M #3

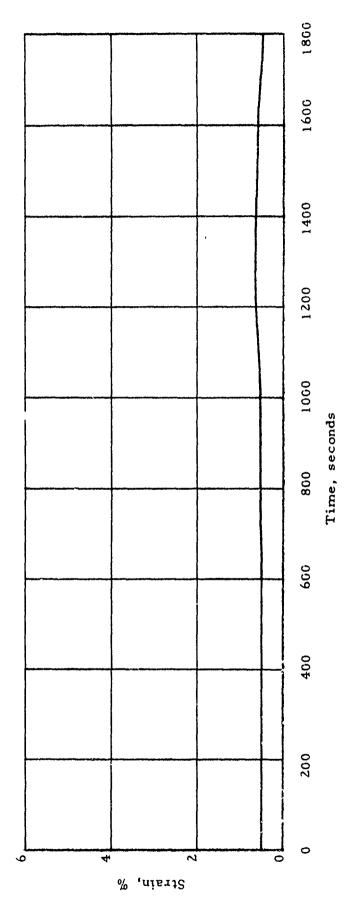
Test - A-2 (DMP-3)

Gage - C3-26

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\rm o}F$



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3

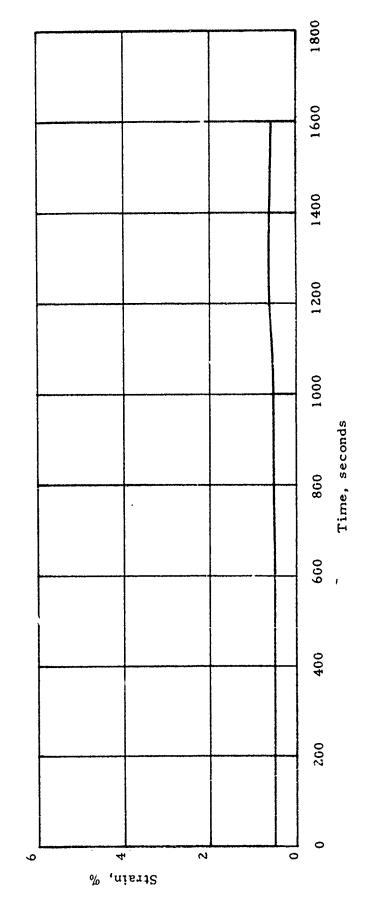
Test - A-3 (DMP-3)

Gage - C3-20

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 $^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3

Test - A-4 (HSMH)

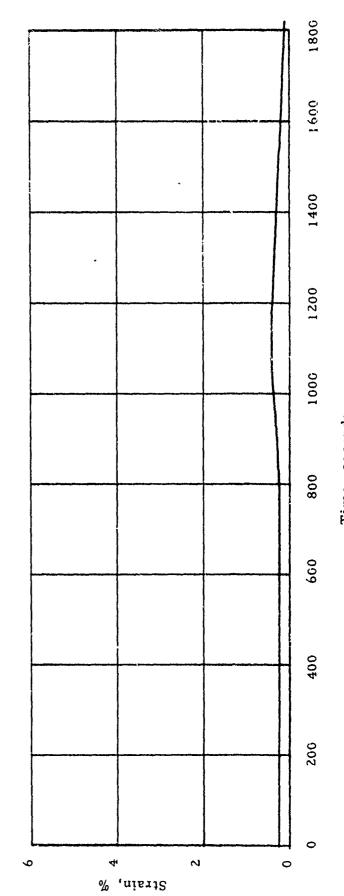
Gage - C3-20

Location - Aft

Tinitial - 55°F

The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Time, seconds

Bore Strain Response to Aeroheat Loads--Gage C3-20

Motor - 1M #3

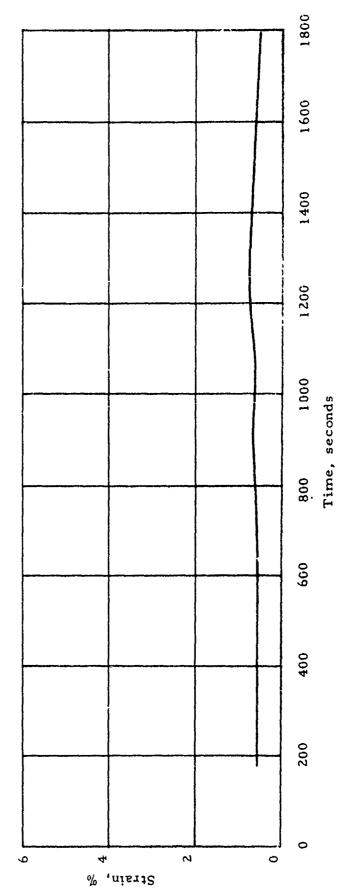
Test - A5 (HSMH)

Gage - C3-20

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Bore Strain Response to Aeroheat Loads -- Gage C3-20

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Motor - IM #3

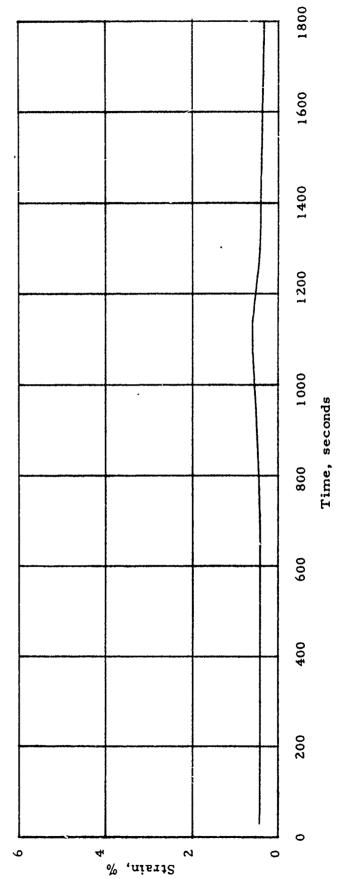
Test - A6 (HSMH)

Gage - C3-20

Location - Aft

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$.

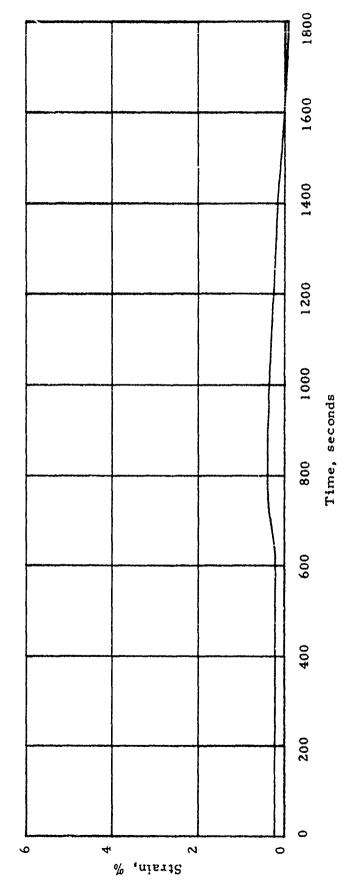


Bore Strain Response to Aeroheat Loads -- Gage C3-20

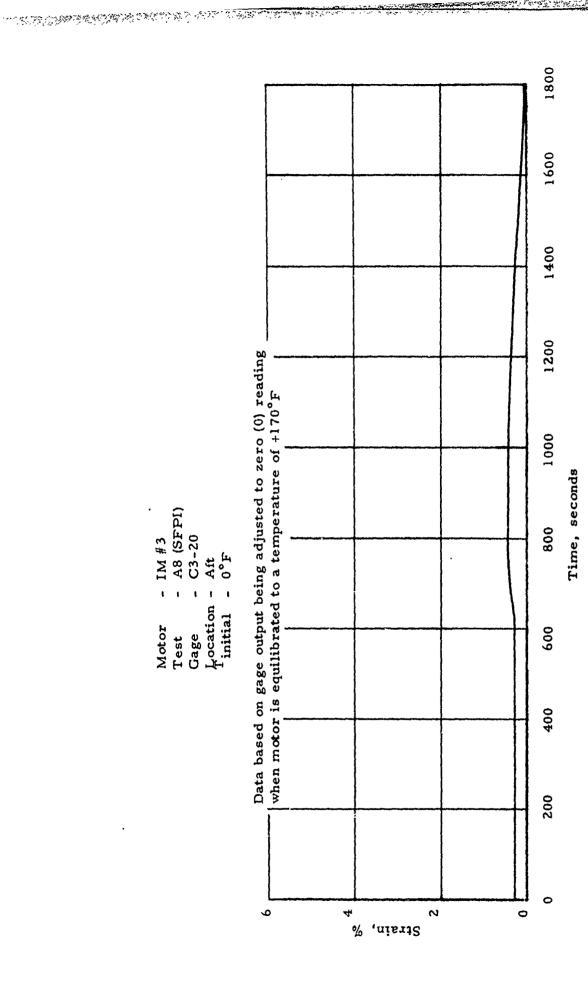
A CONTRACTOR OF THE PROPERTY OF THE PARTY OF

Motor - IM #3
Test - A7 (SFPI)
Gage - C3-20
Location - Aft
Tinitial - +60°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}F$



Bore Strain Response to Aeroheat Loads -- Gage C3-20



A8 (SFPI)

C3-20 Aft

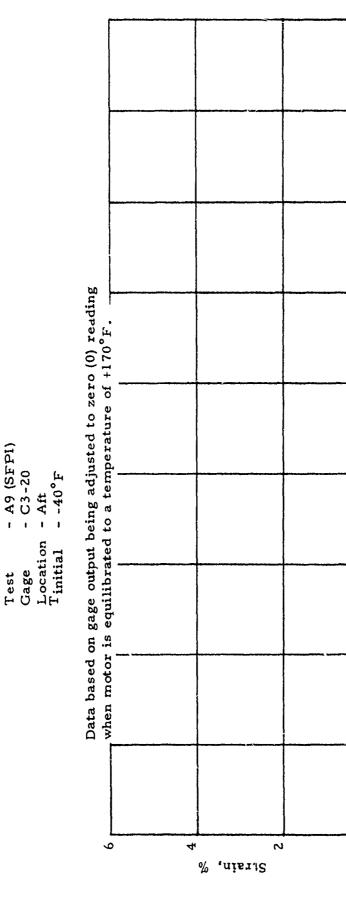
- IM#3

Motor

Test Gage

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Bore Strain Response to Aeroheat Loads -- Gage C3-20

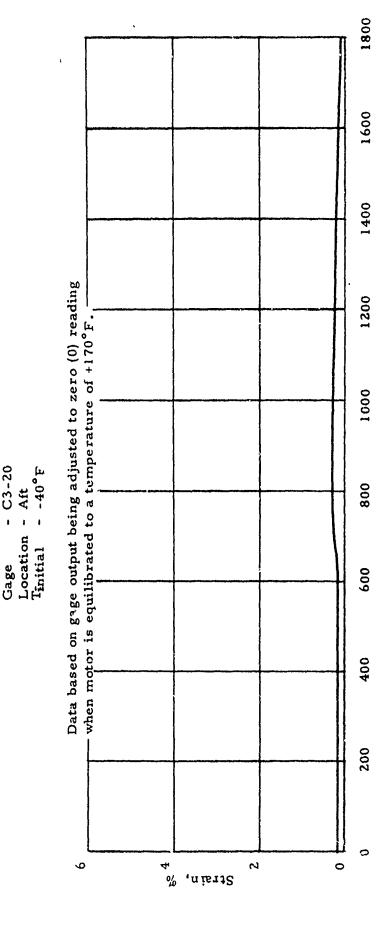


- IM #3

Motor

Bore Strain Response to Aeroheat Loads -- Gage C3-20

Time, seconds



- A-10 (SFPI) - C3-20

- IM#3

Motor

Test

The second of th

Bore Strain Response to Aeroheat Loads -- Gage C3-20

Time, seconds

Motor - IM #3.

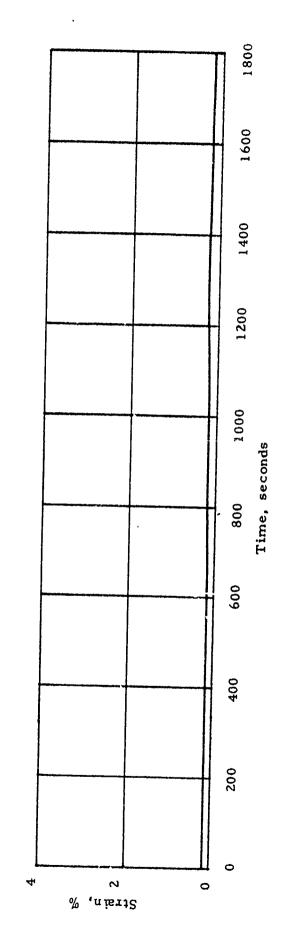
Test - A-11 (DMP-3)

Gage - C3-20

Location - Aft

Tinitial - -40°F

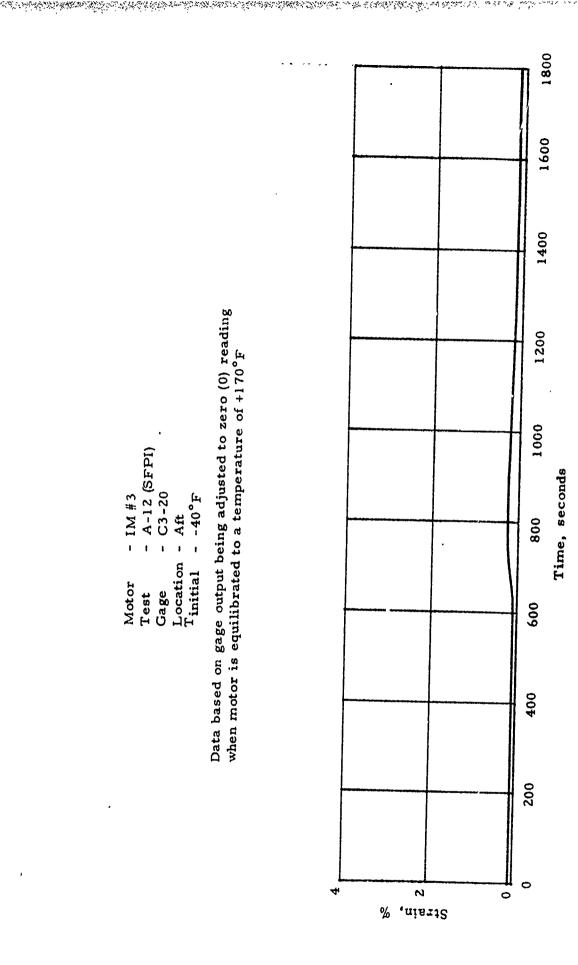
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$.



Bore Strain Response to Aeroheat Loads -- Gage C3-20

A-12 (SFPI) - IM#3 C3-20 - -40°F Location Tinitial Motor Test Gage

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F

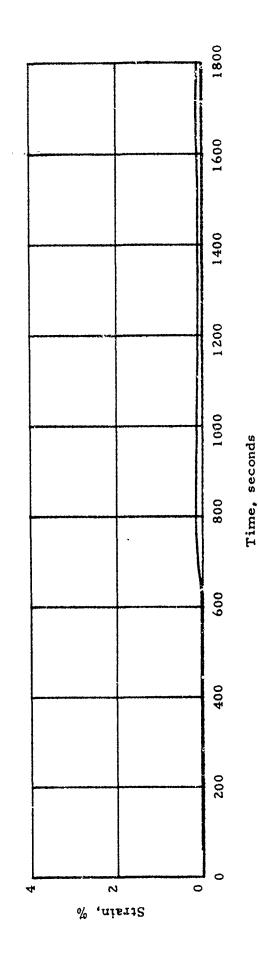


Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor IM#3.

Test A-13 (SFPI)
Gage C3-20
Location Aft
Tinitial -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170^{\circ}\mathrm{F}$.



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3.

Test - A-14

Gage - G3-20

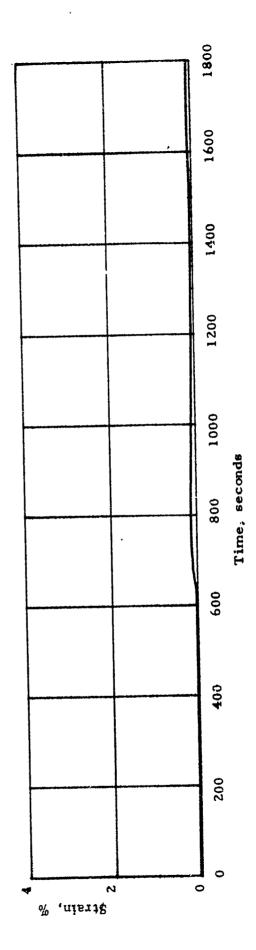
Location - Aft

Tinitial - -65°F

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arment of the state of the second of the sec

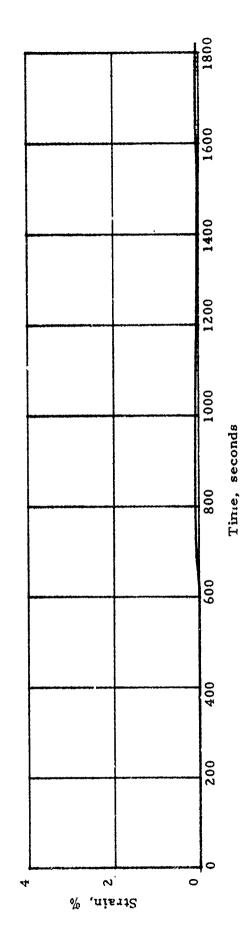
Data based on gage autput being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3
Test - A-15 (SFPI)
Gage - G3-20
Location - Aft
Tinitial - -65 F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,\mathrm{F}.$



Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3

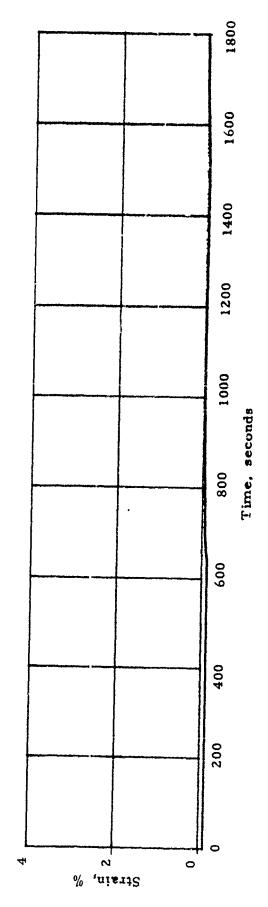
Test - A-16 (SFPI)

Gage - C3-20

Location - Aft

Tinitial --65°F

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Bore Strain Response to Aeroheat Loads -- Gage C3-20

Motor - IM #3

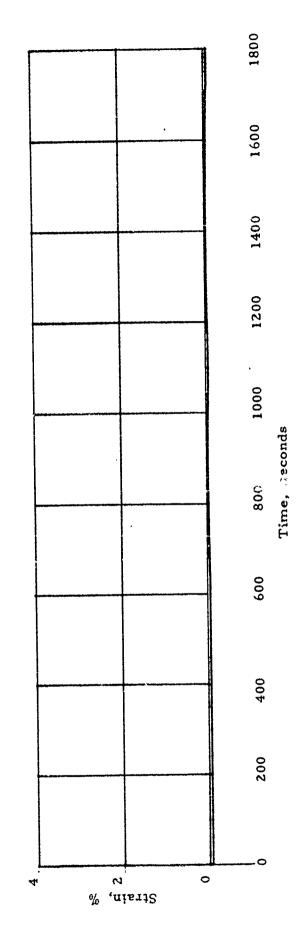
Test - A-17 (DMP-3)

Gage - C3-20

Location - Aft

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F.



Bore Strain Response to Aeroheat Loads -- Gage C3-20

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SECTION C

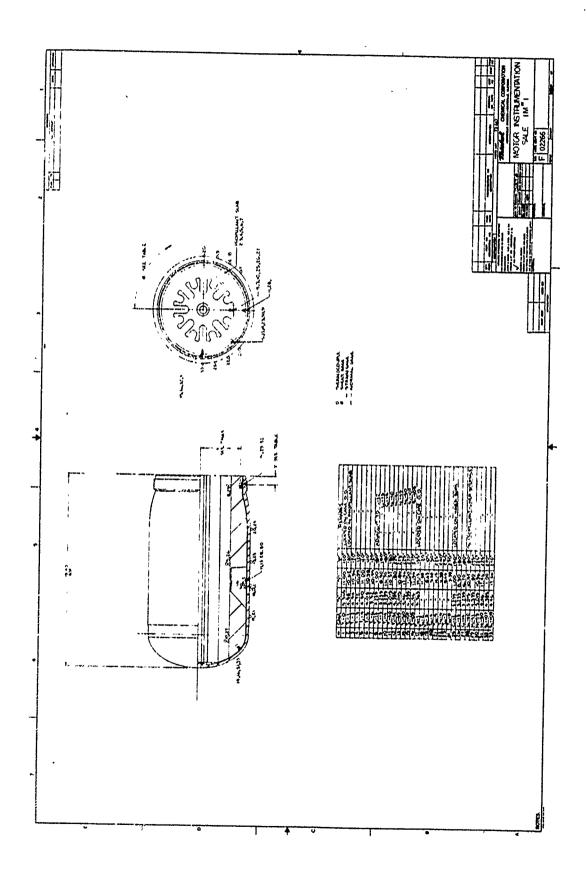
SALE IM #3 DATA SUMMARY

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Head End Normal Stress Response - Tests One through Twelve
Mid Motor Stress Response - Tests One through Ten and Twelve
Aft End Normal Stress Response - Tests One through Ten and Twelve
Head End Shear Stress Response (Shear Gages) - Tests One through
Ten and Twelve

Bore Strain Response (Clir Gages) - Tests One through Ten and Twelve



TEST CHRONOLOGY OF IM #1

Test	Test Dates	Acroheat Mission	Initial Motor Temperature, T
A-1	74 Feb 05 (1500 hrs)	DMP-3	- 65
A-2	74 Feb 07 (1510 hrs)	DMP-3	- 65
A-3	74 Feb 08 (1310 hrs)	нѕмн	- 65
A-4	74 Feb 11 (1050 hrs)	SFPI	0
A-5	74 Feb 12 (1500 hrs)	SFPI	-40
A6	74 Feb 13 (1440 hrs)	DMP-3	-65
A-7	74 Feb 14 (1230 hrs)	SFPI	- 65
A-8	74 Feb 15 (1440 hrs)	SFPI	- 65
A-9	74 Feb 19 (1300 hrs)	SFPI	- 65
A-10	74 Feb 20 (1240 hrs)	SFPI	-65
A-11	74 Feb 21 (1330 hrs)	SFPI	-65
A-12	74 Feb 22 (1050 hrs)	DMP-3	- 65

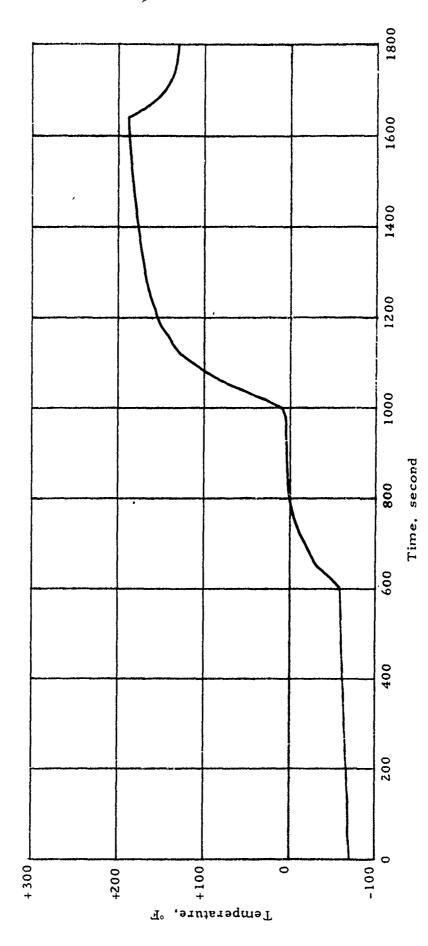
Motor - IM #1

Test - A-1(DMP-3)

Gage - TM-5

Location - Center

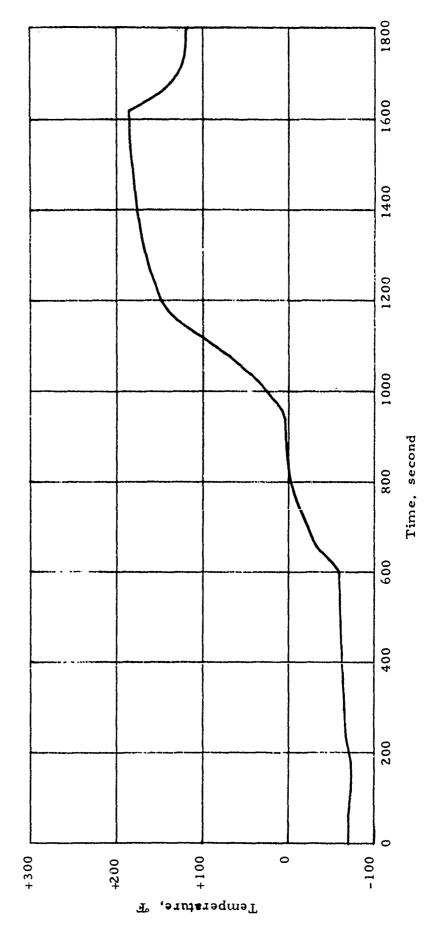
Tinitial - -65 F

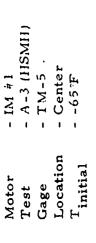


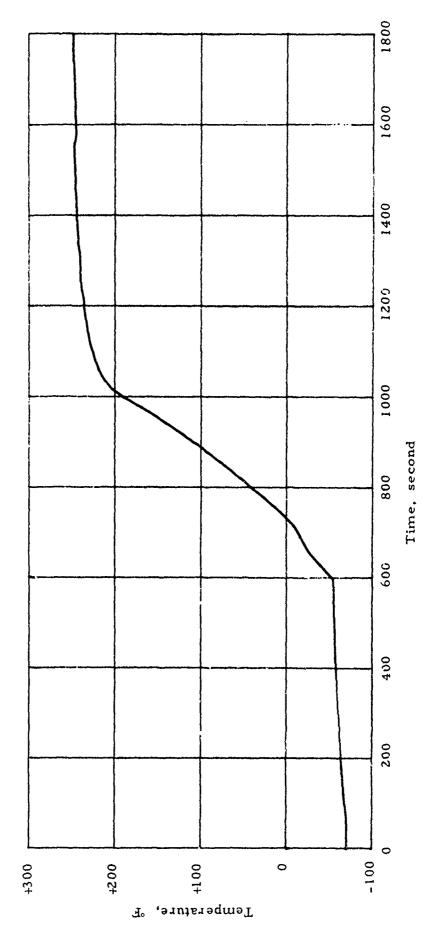
Temperature Profile

Motor - IM #1 Test - A-2 (DMP-3) Gage - TM-5· Location - Center Tinitial - -65°F

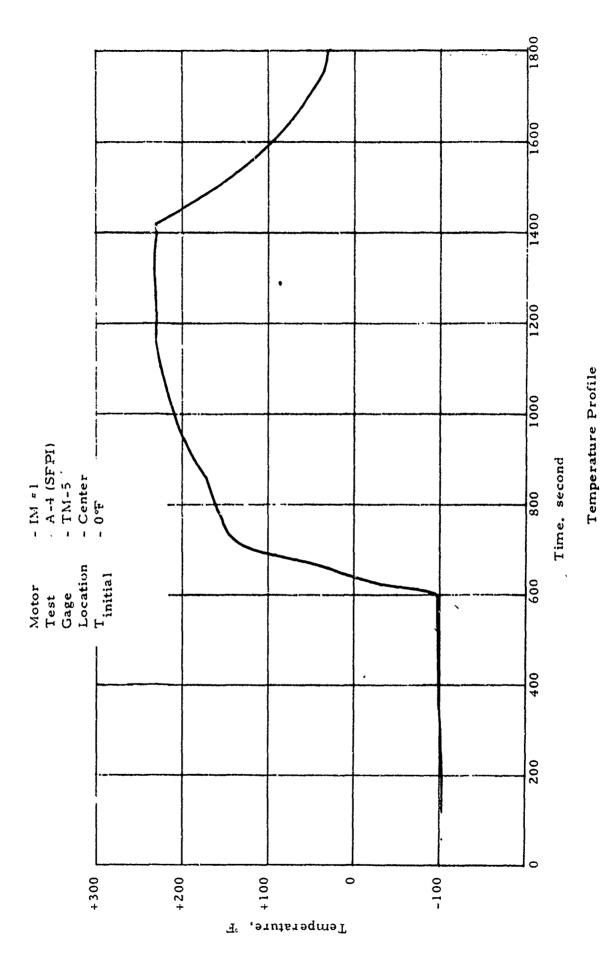
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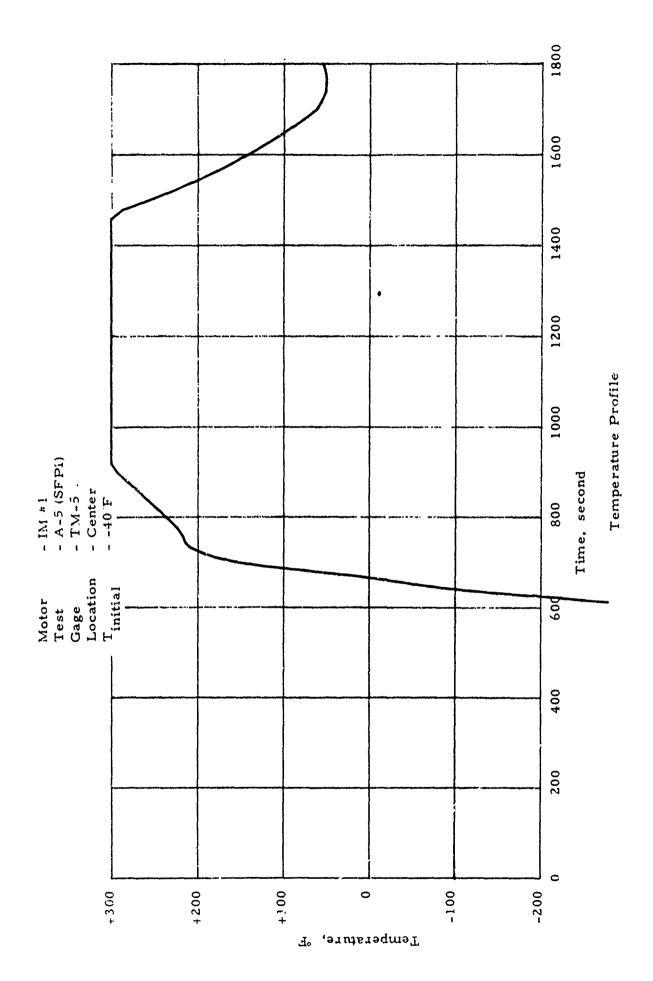


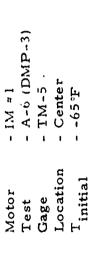


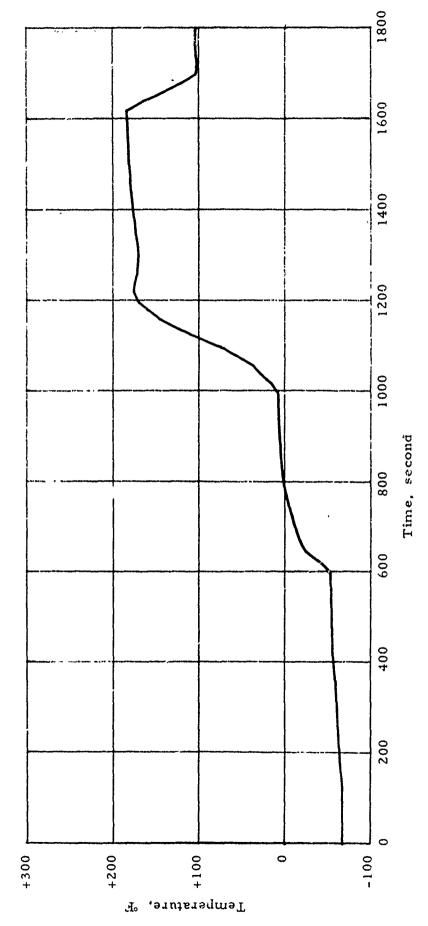
Temperature Profile

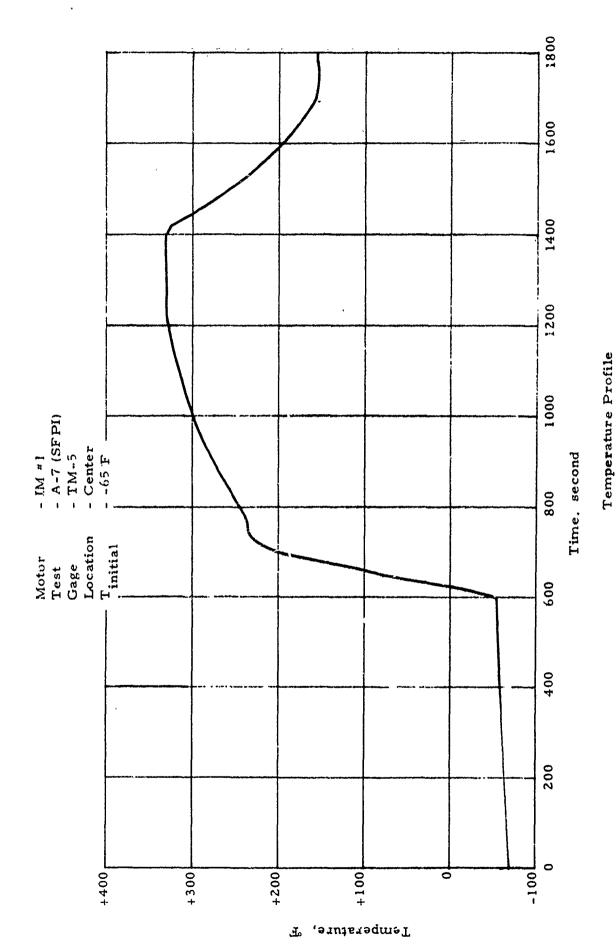


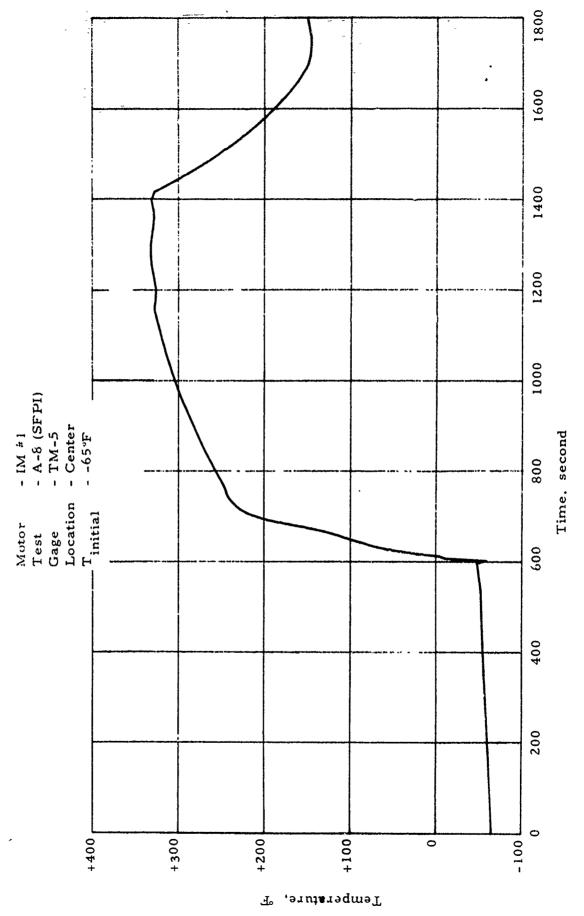
74500000 C 1880000











Temperature Profile

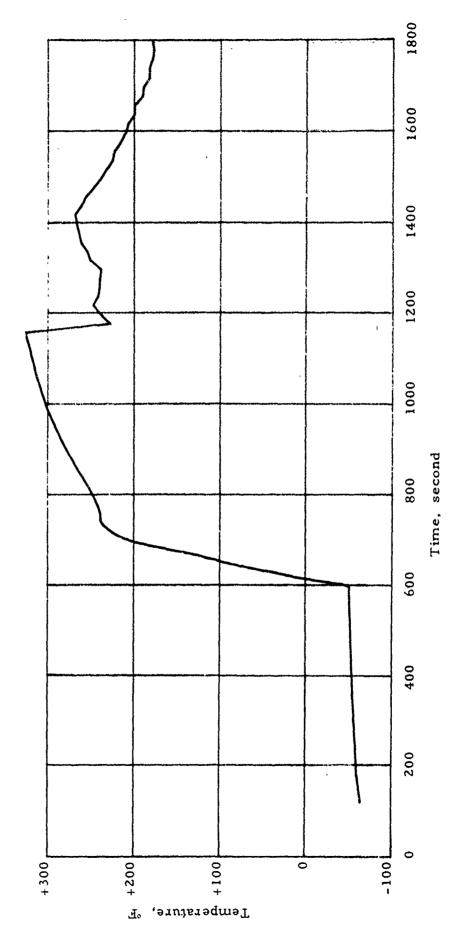
Motor - IM # 1

Test - 7.-9 (SFPI)

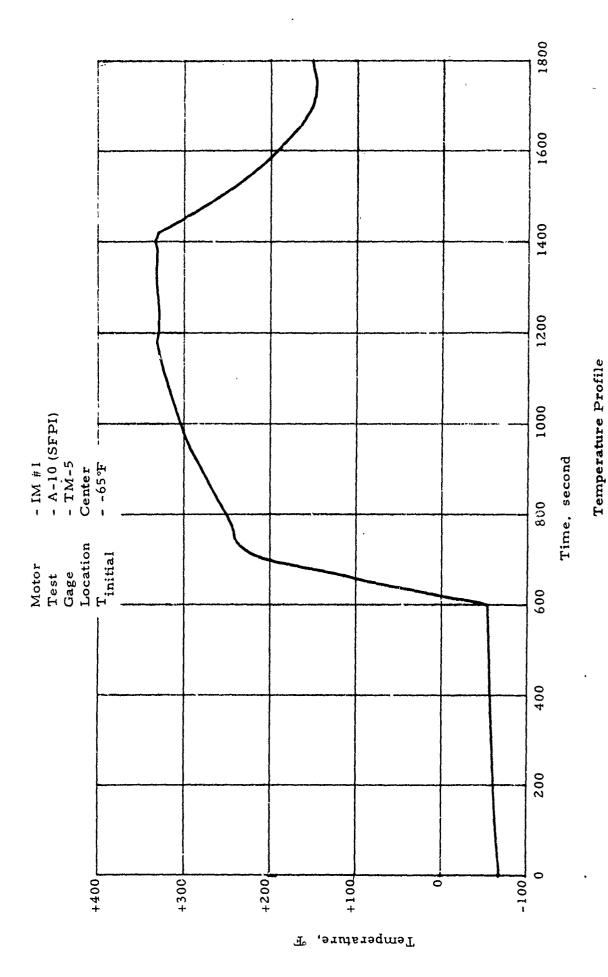
Gage - 1M-5

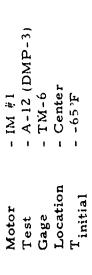
Location - Center

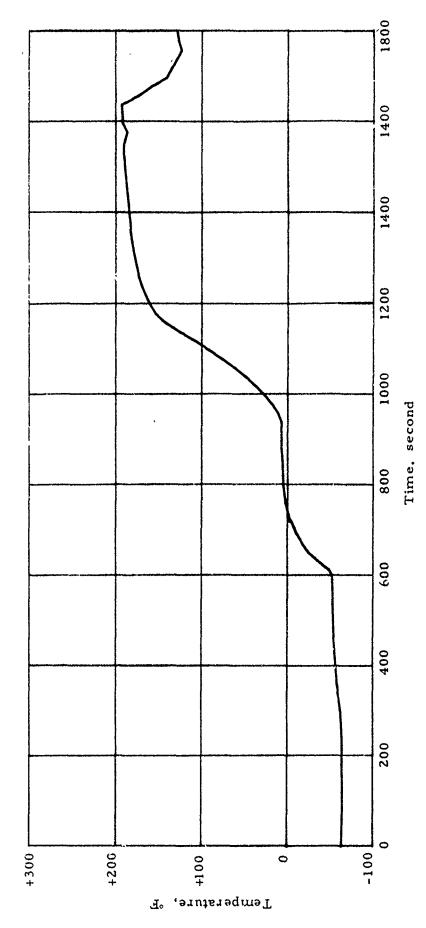
Tinitial --65 F



Temperature Profile







Temperature Profile

Motor - IM #1

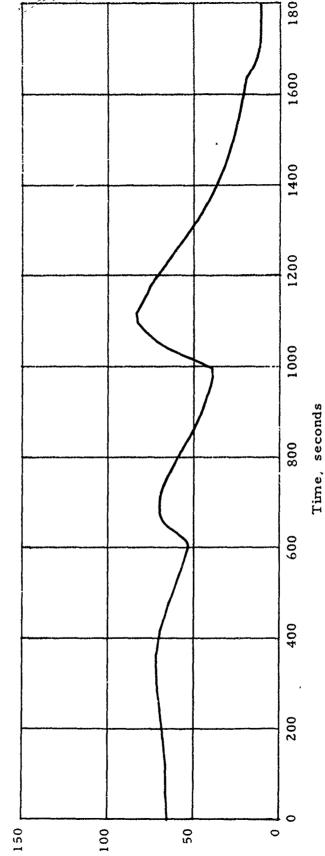
Test - A-1 (DMP-3)

Gage - N1-50

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero '0' reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Head End Normal Stress Response to Aeroheat Loads - Gage NI-50 (Test No. A-1)

Normal Stress, psi

Motor - IM #1

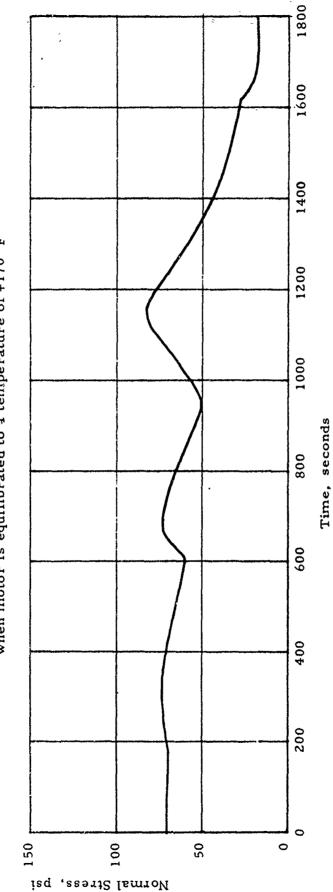
Test - A-2 (DMP-3)

Gage - N1-50

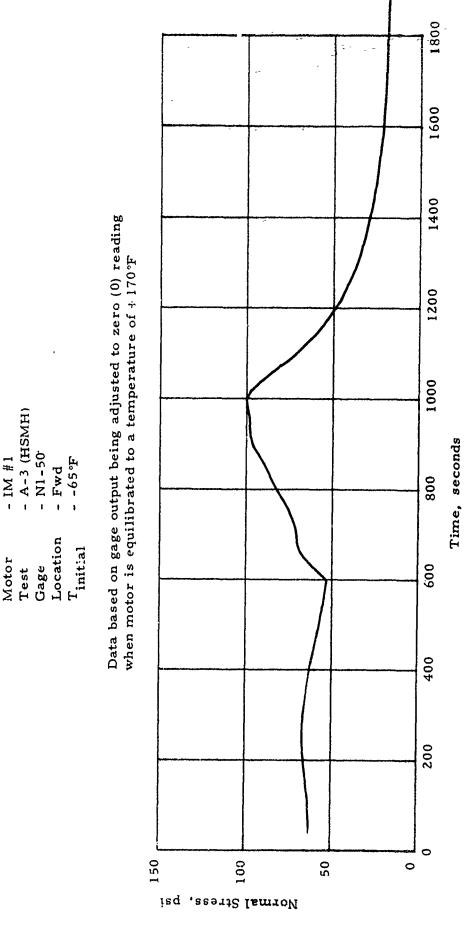
Location - Fwd

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170° F



Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-2)



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Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-3)

Motor - IM #1

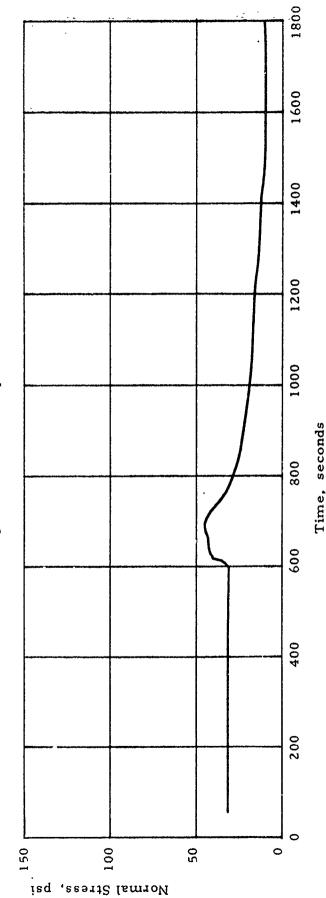
Test - A-4 (SFPI)

Gage - N1-50

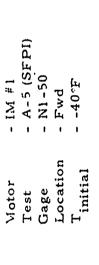
Location - Fwd

Tinitial - 0*F

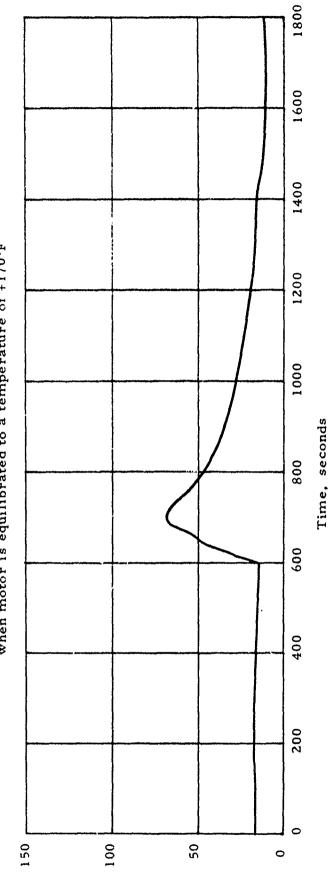
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of + 170°F



Head End Normal Stress Response to Aeroheat Loads - Gage NI-50 (Test No. A-4)



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170°F



Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-5)

Normal Stress, psi

Motor - IM #1

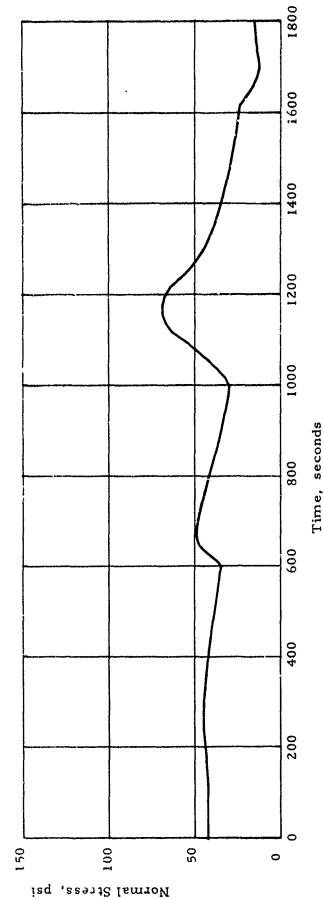
Test - A-6 (DMP-3)

Gage - N1-50

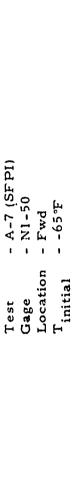
Location - Fwd

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}F$

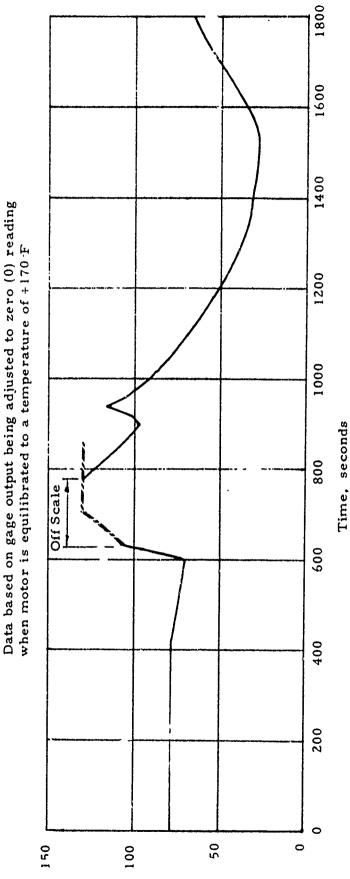


Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-6)



- IM 41

Motor

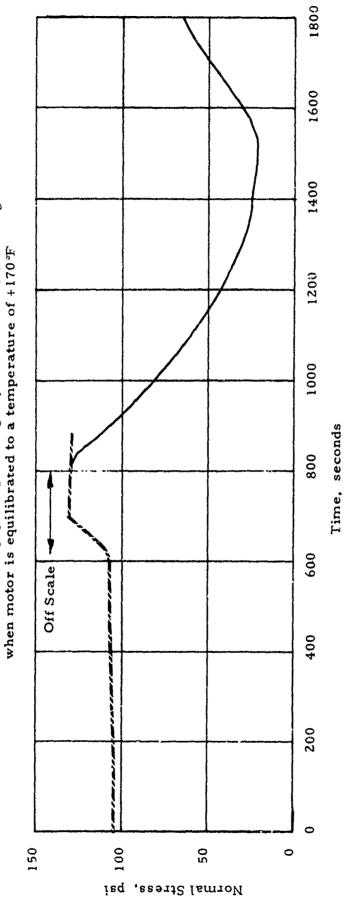


Head End Normal Stress Response to Aeroheat Loads - Gage NI-50 (Test No. A-7)

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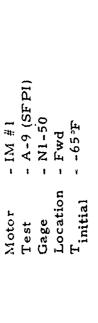
- A-8 (SFPI) - N1-50 - 1M #1 - -65°F - Fwd Location $T_{initial}$ Motor Gage Test

Data based on gage out, ! being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170%

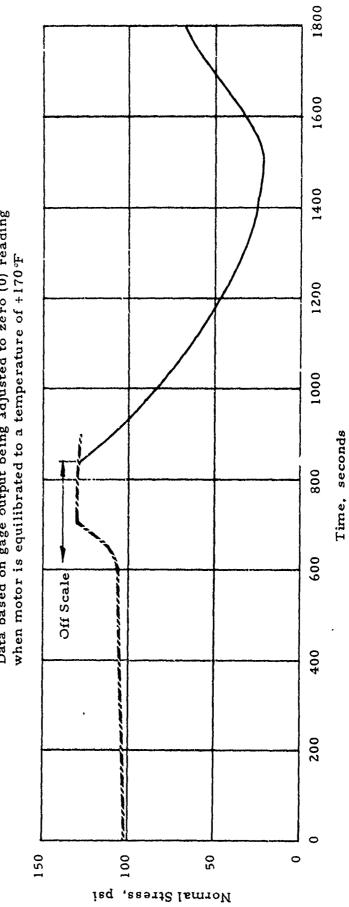


Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-8)

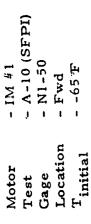
į



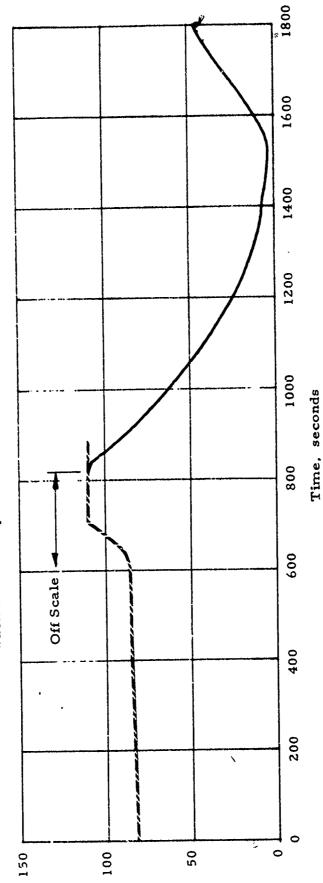
Data based on gage output being adjusted to zero (0) reading



Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-9)

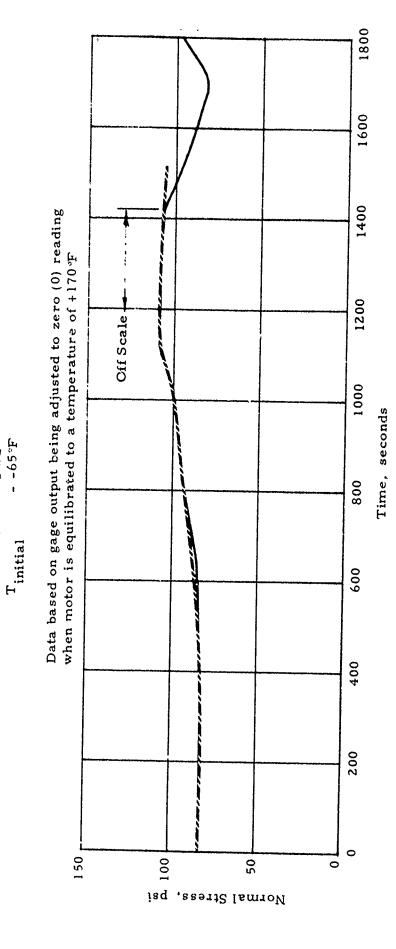


Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,{\rm F}$



Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-10)

Normal Stress, psi



- A-12 (DMP-3)

. IM #1

Motor

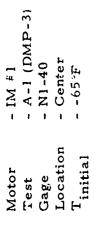
- N1-50

- -65°F - Fwd

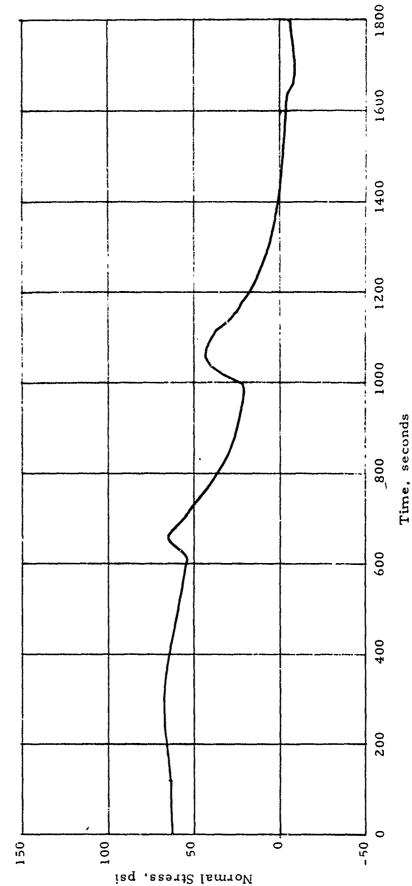
Location

Gage Test

Head End Normal Stress Response to Aeroheat Loads - Gage N1-50 (Test No. A-12)



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^\circ\! F$



Mid Motor Stress Response to Aeroheat Loads - Gage NI-40 (Test No. A-1)

Motor - IM #1

Test - A-2 (DMP-3)

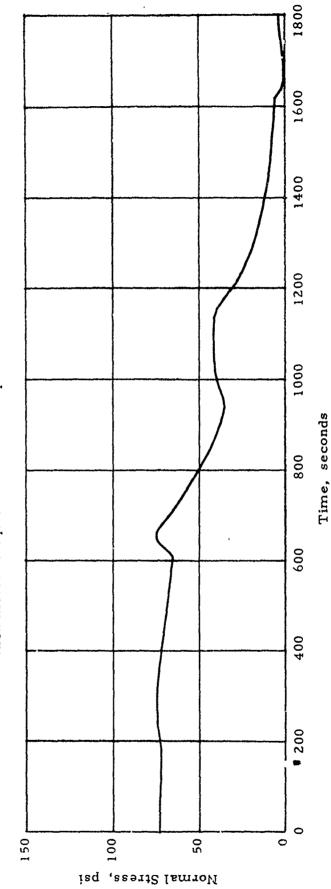
Gage - N1-40

Location - Center

Tinitial --65°F

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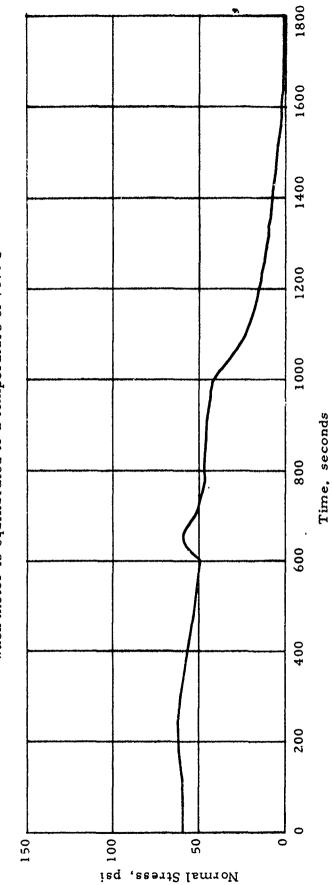
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,^\circ\mathrm{F}$



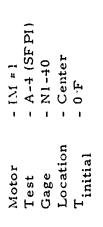
Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-2)

Motor - IM # i Test - A-3 (HSMH) Gage - N1-40 Location - Center Tinitial - -65°F

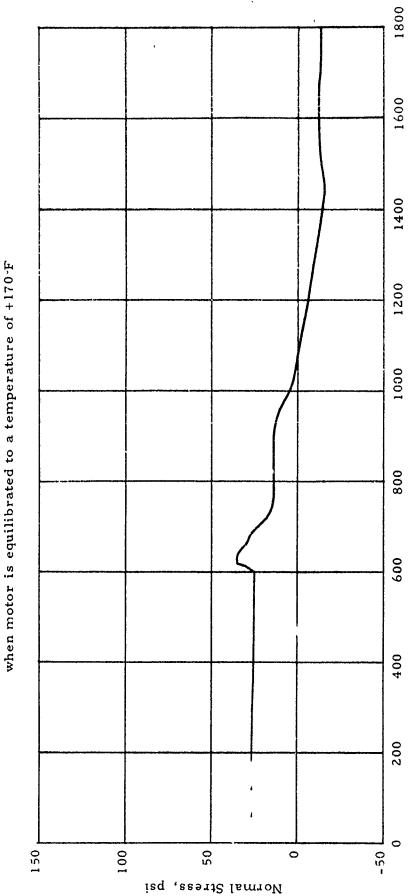
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Mid Motor Stress Response to Aeroheat Loads - Gage NI-40 (Test No. A-3)



Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^\circ\mathrm{F}$



Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-4)

Time, seconds

Motor - IM #1

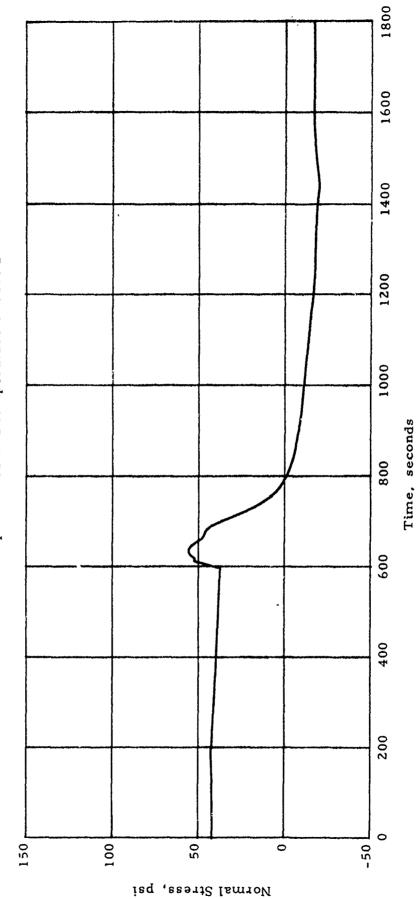
Test - A-5 (SFPI)

Gage - N1-40

Location - Center

Tinitial - -40 F

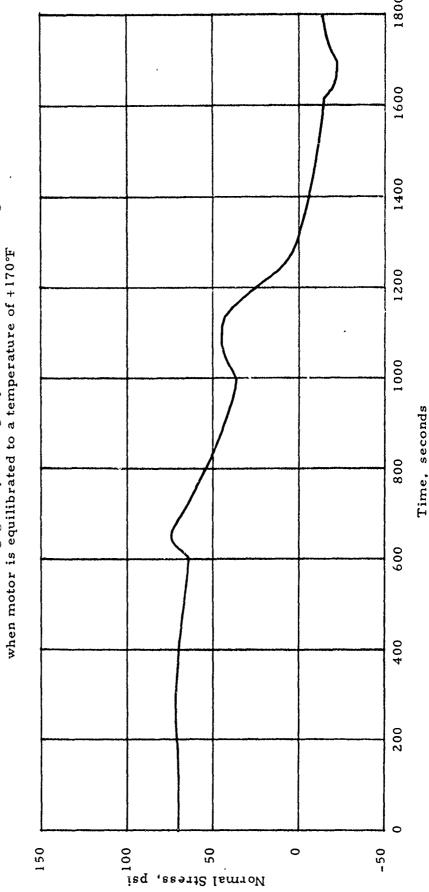
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,^\circ\! F$



Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-5)

- A-6 (DMP-3) - Center - N1-40 -657F Location Tinitial Motor Gage Test

Data based on gage output being adjusted to zero (0) reading



Mid Motor Stress Response to Aeroheat Loads - Gage NI-40 (Test No. A-6)

Motor - IM #1

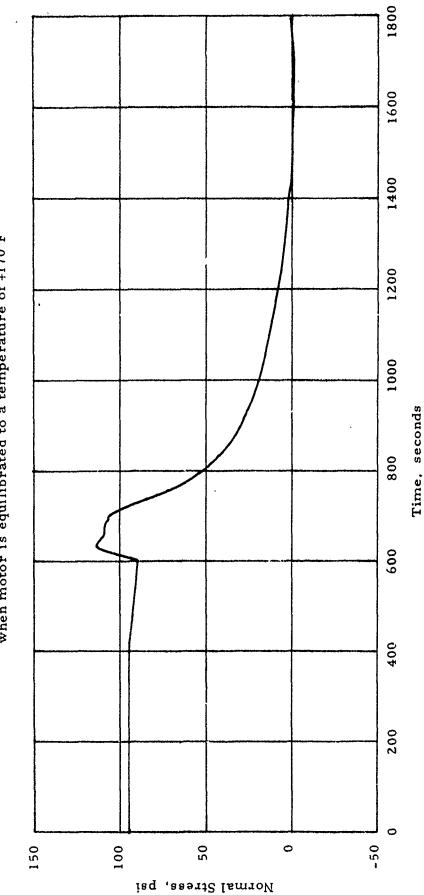
Test - A-7 (SFPI)

Gage - NI-40

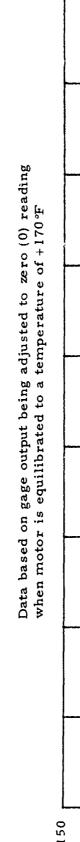
Location - Center

Tinitial -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\text{F}$



Mid Motor Stress Response to Aeroheat Loads - Gage NI-40 (Test No. A-7)



- A-8 (SFPI)

- IM #1

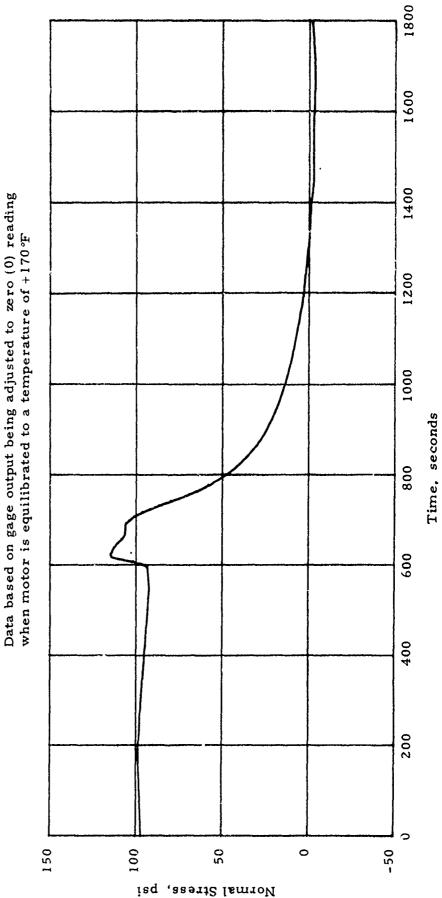
Motor Test Gage

- Center - NI-40

> Location $T_{initial}$

- -65 王

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Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-8)

Motor - IM #1

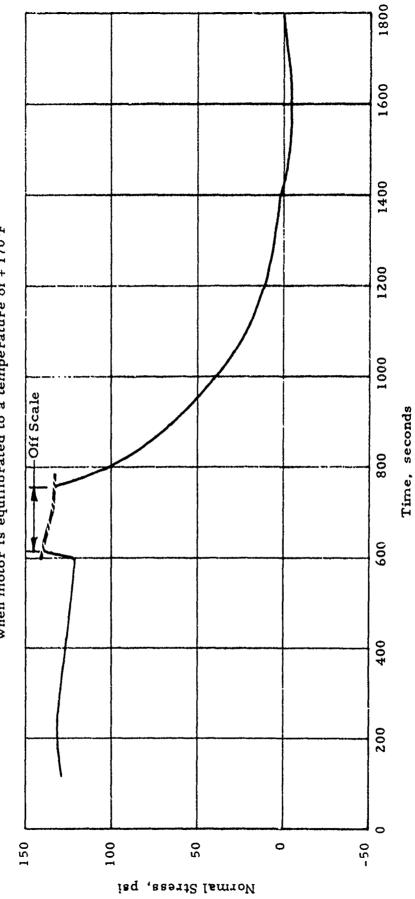
Test - A-9 (SFPI)

Gage - N1-40

Location - Center

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm\,170\,\mathrm{T}$



Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-9)

Motor - 1M #1

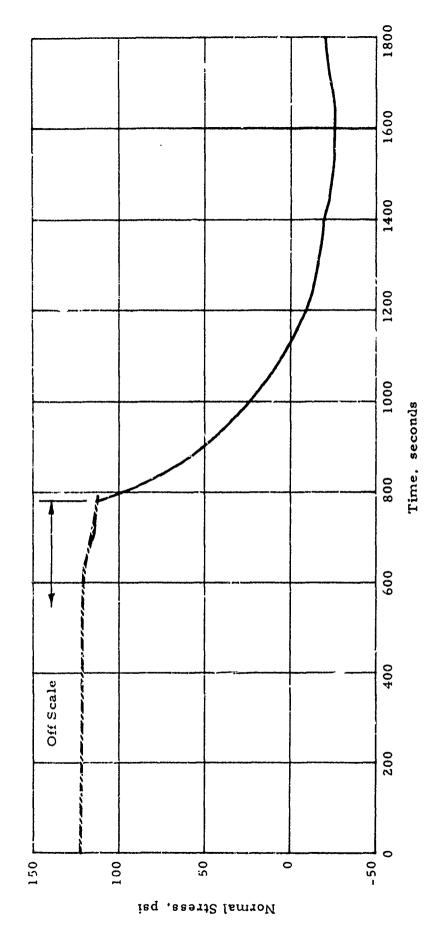
Test - A-10 (SFPI)

Gage - N1-40

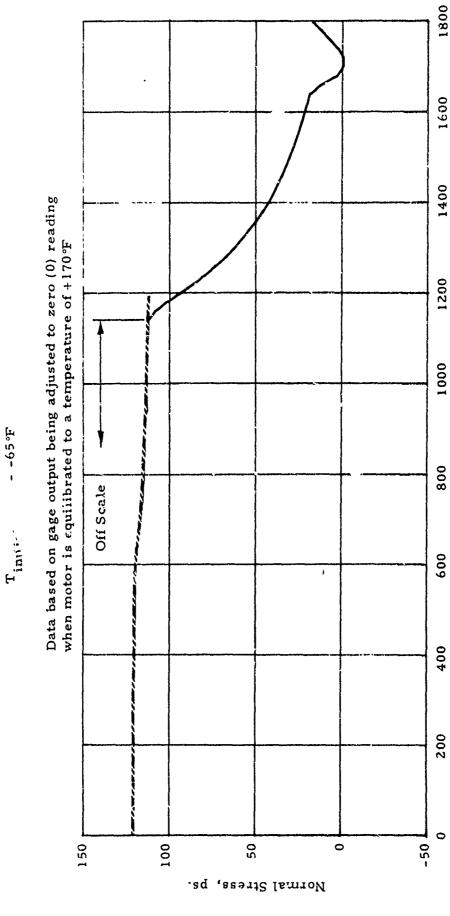
Location - Center

Tinitial --65 F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm\,170\,\mathrm{T}$



Mid Motor Stress Response to Aeroheat Loads - Gage NI-40 (Test No. A-10)



- A-12 (DMP-3)

- IM #1

Motor

- N1-40 - Center

Location

Test Gage

Mid Motor Stress Response to Aeroheat Loads - Gage N1-40 (Test No. A-12)

Time, seconds

Motor - IM #1

Test - A-1 (DMP-3)

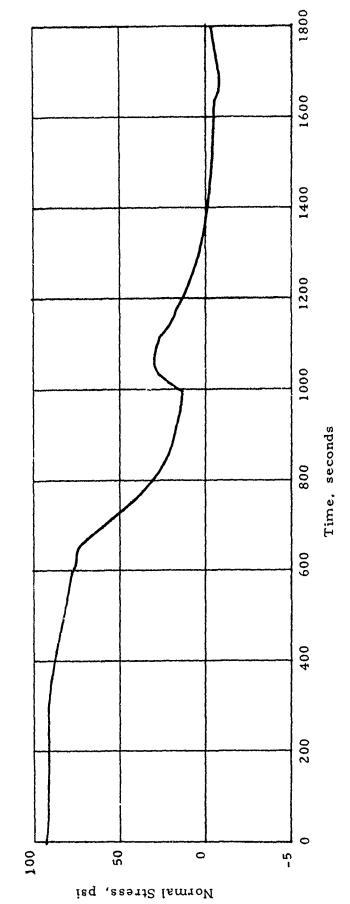
Gage - N1-49

Location - Center

Tinitial - -65°F

The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Mid Motor Normal Stress Response to Aeroheat Loads - Gage NI-49 (Test No. A-1)

 Motor
 - IM #1

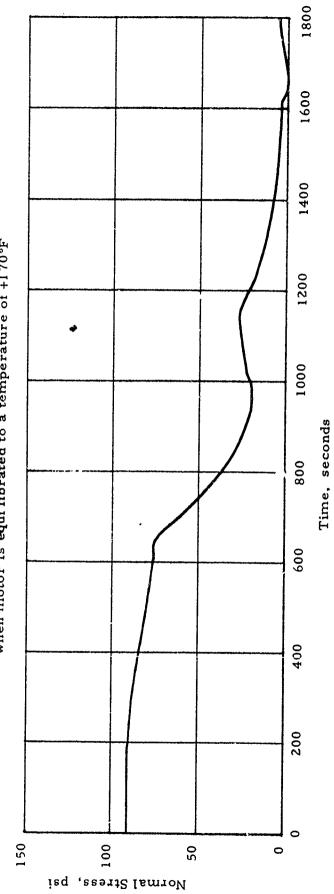
 Test
 - A-2 (DMP-3)

 Gage
 - N1-49

 Location
 - Center

 Tinitial
 - -65°F

Dsta based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}\mathrm{F}$



Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-2)

Motor - IM #1

Test - A-3 (HSMH)

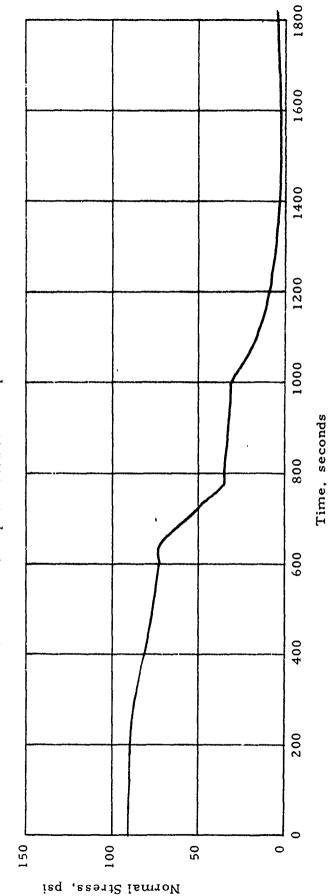
Gage - N1-49

Location - Center

Tinitial --65°F

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Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-3)

Motor - IM #1

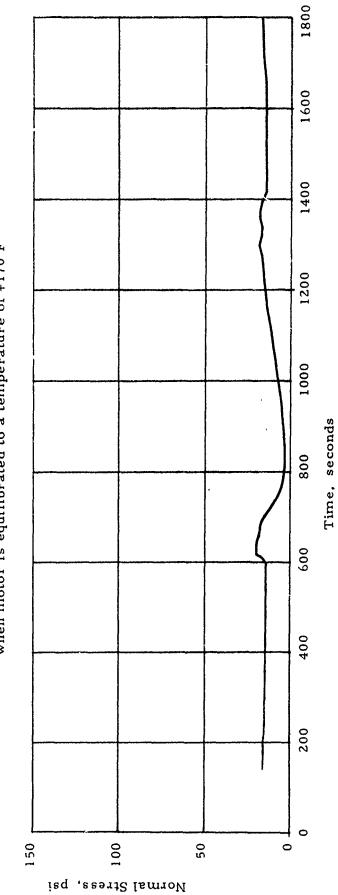
Test - A-4 (SFPI)

Gage - N1-49

Location - Center

Tinitial - 0°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,^{\circ}\text{F}$



Mid Motor Normal Stress Response to Aeroheat Lo. .s - Gage N1-49 (Test No A-4)

 Motor
 - IM #1

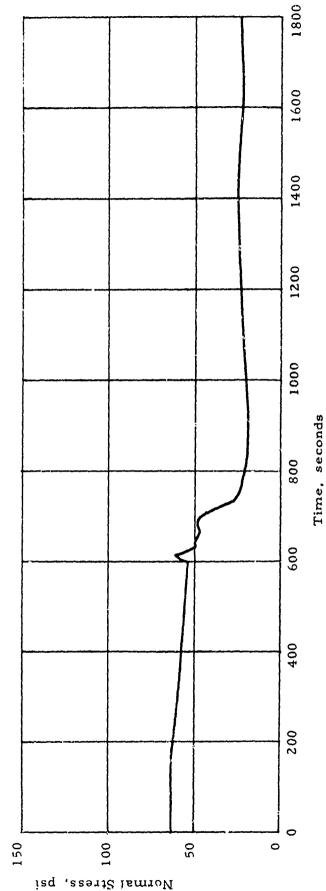
 Test
 - A-5 (SFPI)

 Gage
 - N1-49

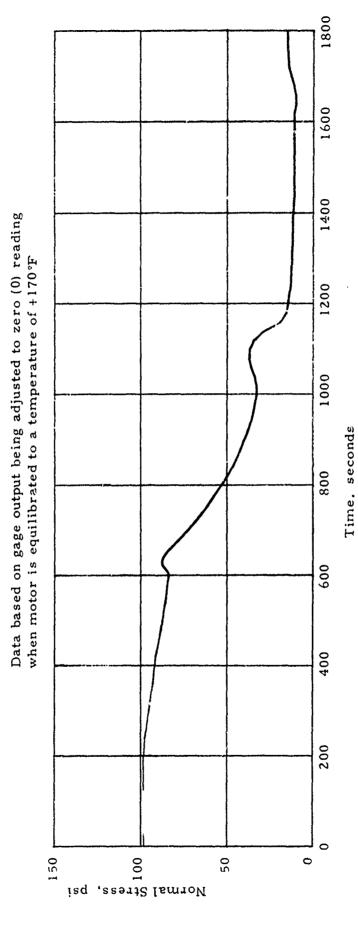
 Location
 - Center

 Tinitial
 - -40°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of + 170°F



Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-5)



- A-6 (DMP-3)

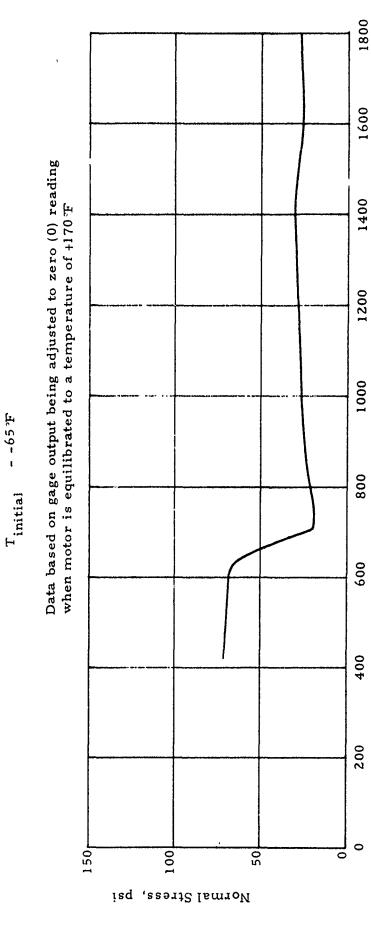
Motor

- N1-49 - Center

> Location Tinitial

Test Gage - -65 F

Mid Motor Normal Stress Response to Aeroheat Loads - Gage NI-49 (Test No. A-6)



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- A-7 (SFPI)

- IM #1

Motor

- Center - N1-49

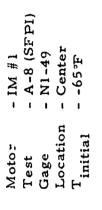
Location

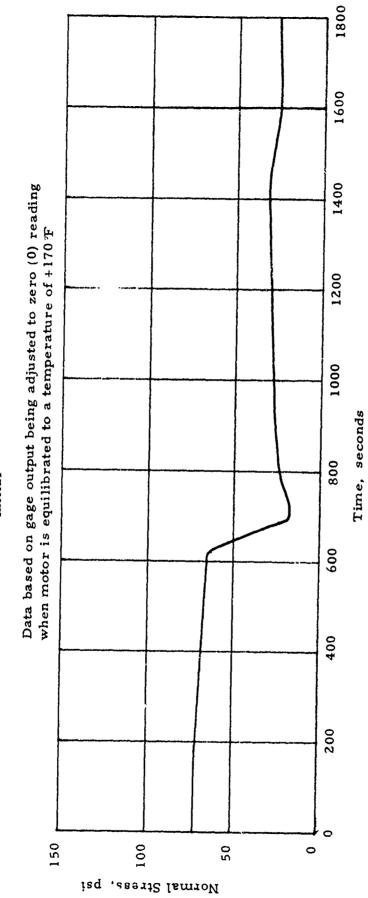
Gage Test

- -65°F

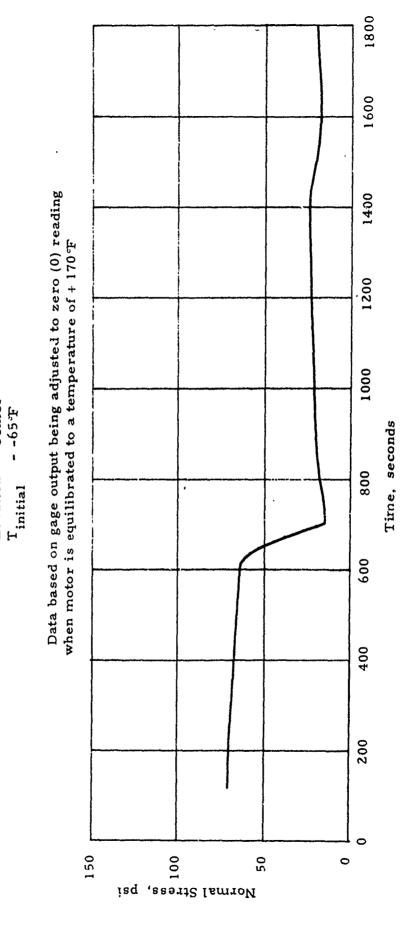
Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-7)

Time, seconds





Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-8)



- A-9 (SFPI)

- IM #1

Motor

- Center

Location

- -65 F

- N1-49

Gage Test

Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-9)

Motor - IM #1

Test - A-10 (SFPI)

Gage - N1-49

Location - Center

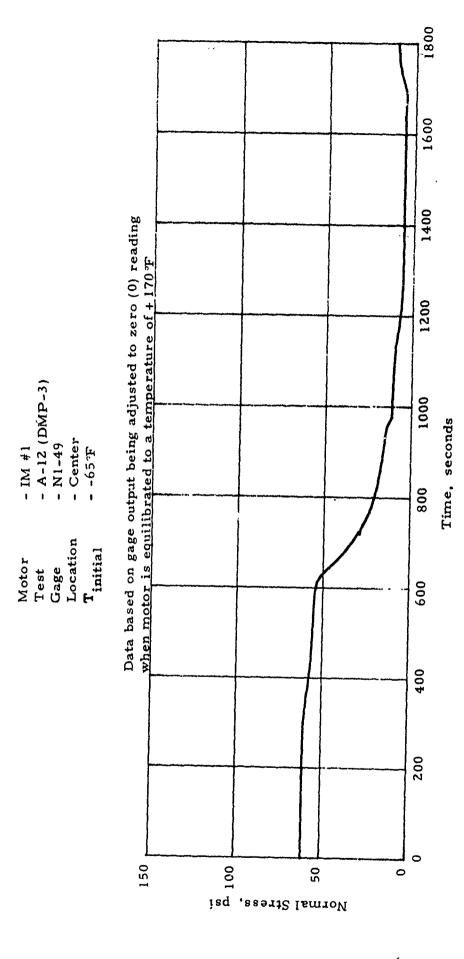
Tinitial - -65 F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170% 40C

Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-10)

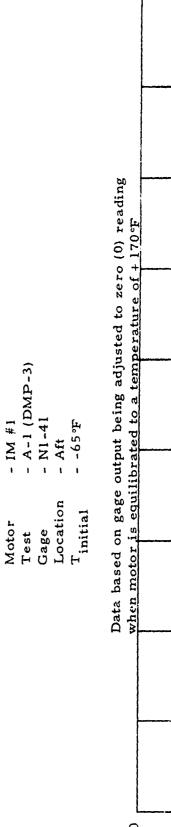
Tirne, seconds

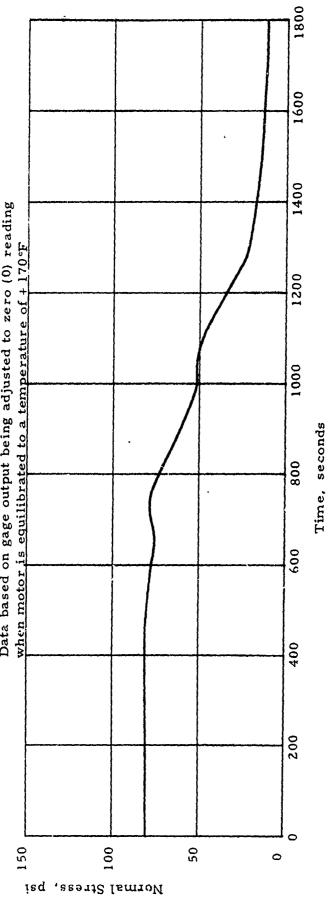
Normal Stress, pai



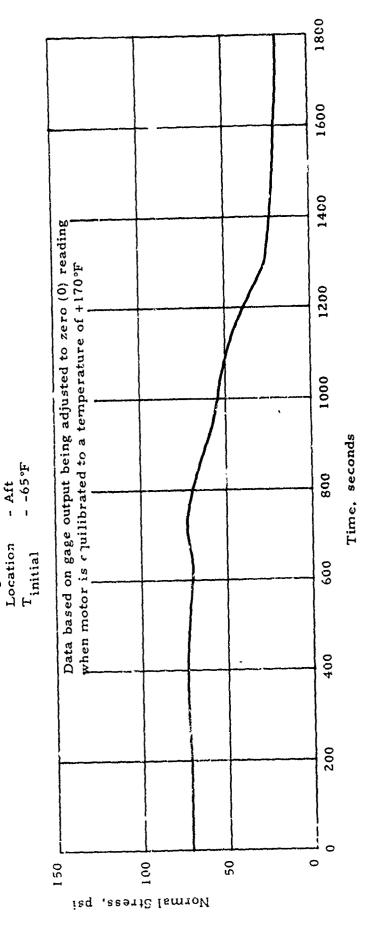
A STATE STATE OF THE STATE OF T

Mid Motor Normal Stress Response to Aeroheat Loads - Gage N1-49 (Test No. A-12)





Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-1)



- A-2 (DMP-3)

- IM #1

Motor

- N1-41

Yest Gage

Aft End Normal Stress Response to Aeroheai Loads - Gage N1-41 (Test No. A-2)

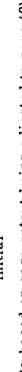
Motor - IM #1

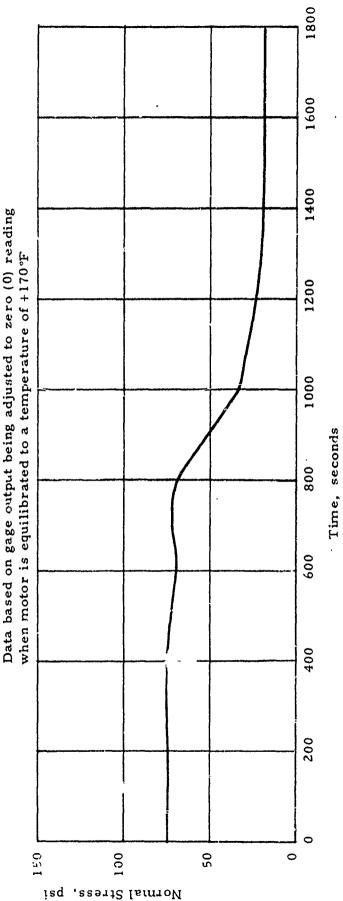
Test - A-3 HSMH)

Gage - N1-41

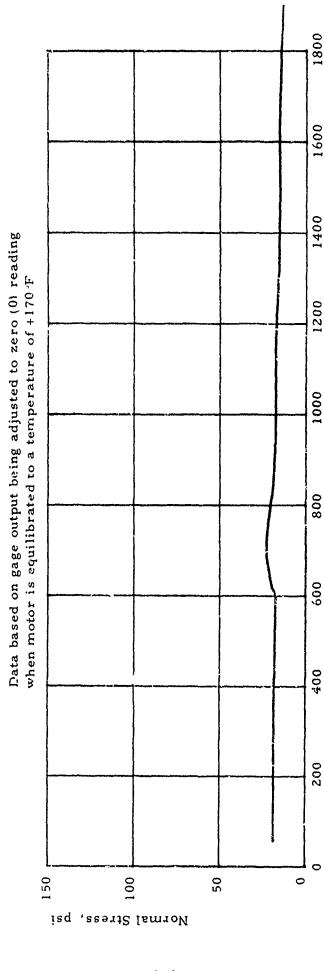
Location - Aft

Tinitia! - -65°F





Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-3)



The state of the s

- IM #1 - A-4 (SFPI)

Motor Test Gage

- N1-41

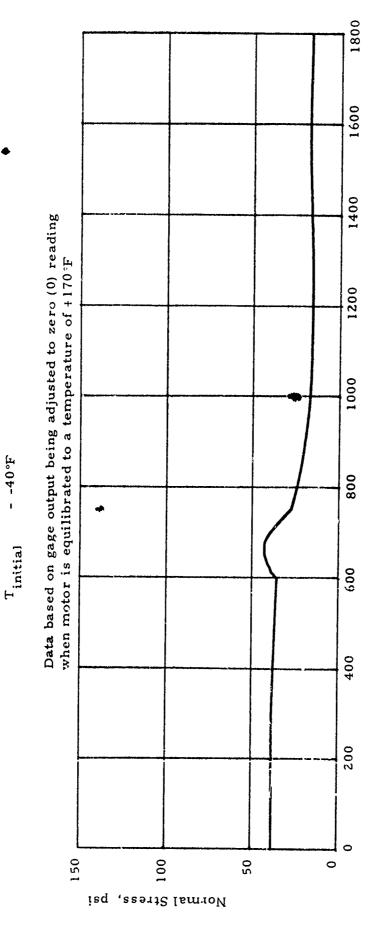
- Aft

Location T initial

The state of the s

Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-4)

Time, seconds



- A-5 (SFPI) - N1-41

- -40°F - Aft

Location

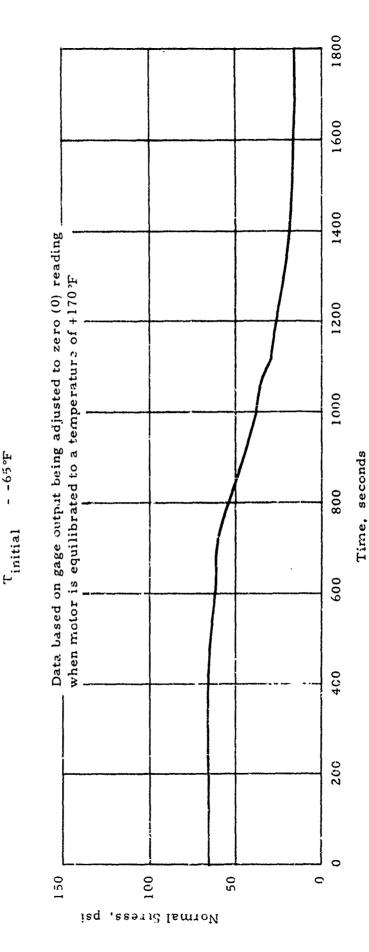
Gage Test

- IM #1

Motor

Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-5)

Time, seconds



- A-6 (DMP-3)

- IM # }

Motor

- N1-41

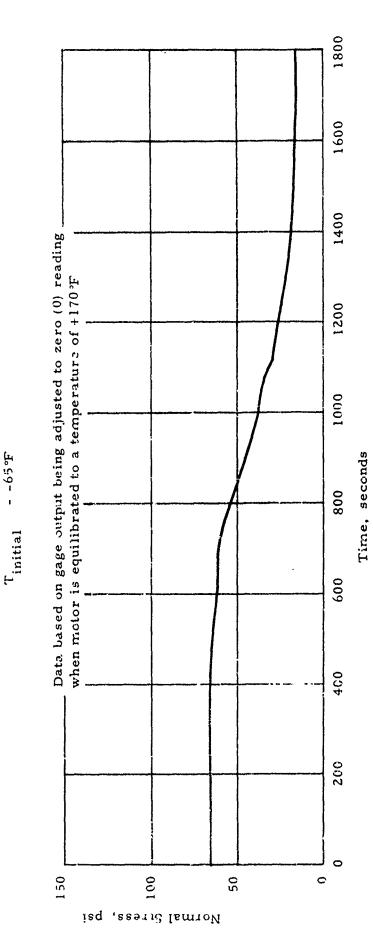
- -65°F

Location

Gage Test

Aft End Normal Stress Response to Aeroheat Loads - Gage NI-41 (Test No. A-6)

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- A-6 (DMP-3)

} # WI -

Motor Test

- N1-41

- -65°F

- Aft

Gage Location

Contract of the second

Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-6)

Motor - IM #1

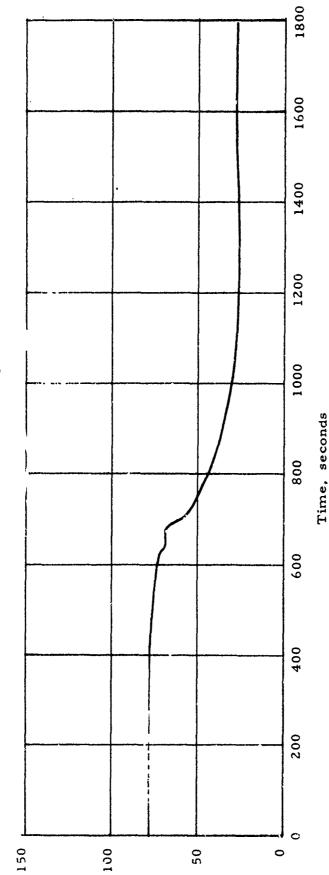
Test - A-7 (SFPI)

Gage - N1-41

Location - Aft

Tinitial --65 F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}F$



Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-7)

Normal Stress, psi

Motor - IM #1

Test - A-8 (SFPI)

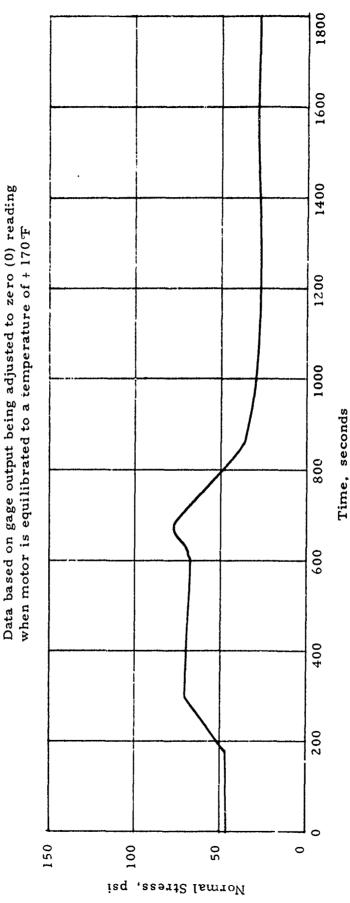
Gage - N1-41

Location - Aft

Tinitial - -65°F

Activities of the second

interaction of the state of the



Aft End Normal viress Response to Aeroheat Loads - Gage N1-41 (Test No. A-8)

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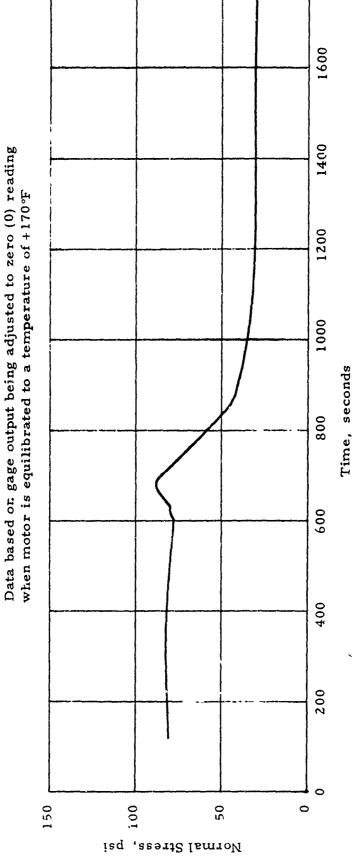
Motor - IM #1

Test - A-9 (SFPI)

Gage - N1-41

Location - Aft

Tinitial --65°F



Aft End Normal Stress Response to Aercheat Loads - Gage NI-41 (Test No. A-9)

Motor - IM #1

Test - A-10 (SFPI)

Gage - N1-41

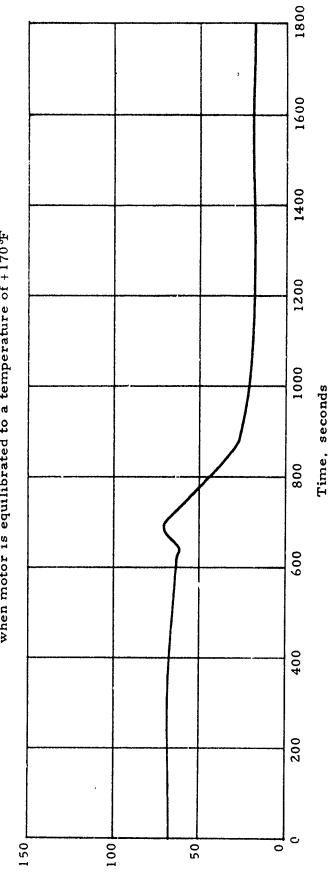
Location - Aft

Tinitial - -65°F

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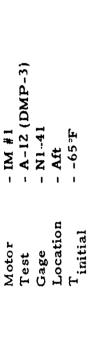
では、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というない。 「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、」というない。「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、」」というない。「一般のでは、「一般のでは、」」というない。「一般のでは、」」というない 「一般のでは、」」というない。」
「「一般のでは、」」」というない。「一般のでは、「一般のでは、」」」というない。「一般のでは、」」というない。「一般のでは、」」」というない。「一般のでは、」」というない。「一般のでは、」」というない。「一般のでは、」」というない。「一般のでは、」」というない 「一般のでは、」」というない。「一般のでは、」」というない。「一般のでは、」」というない。「一般のでは、」」というない。」
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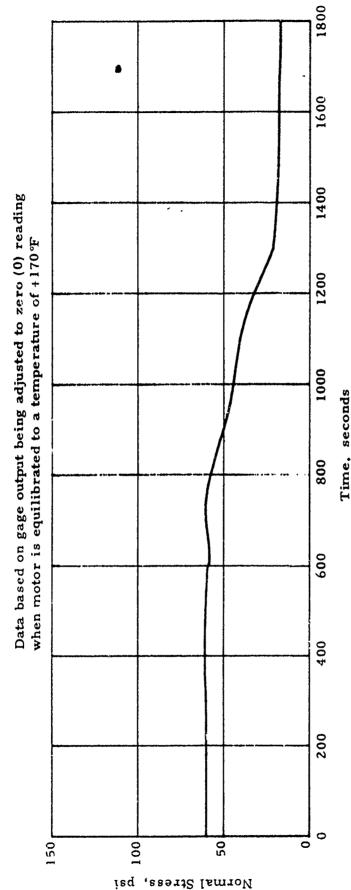
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\, ^\circ\! F$



Normal Stress, psi

Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-10)





Aft End Normal Stress Response to Aeroheat Loads - Gage N1-41 (Test No. A-12)



- A-1 (DMP-3)

- IM #1

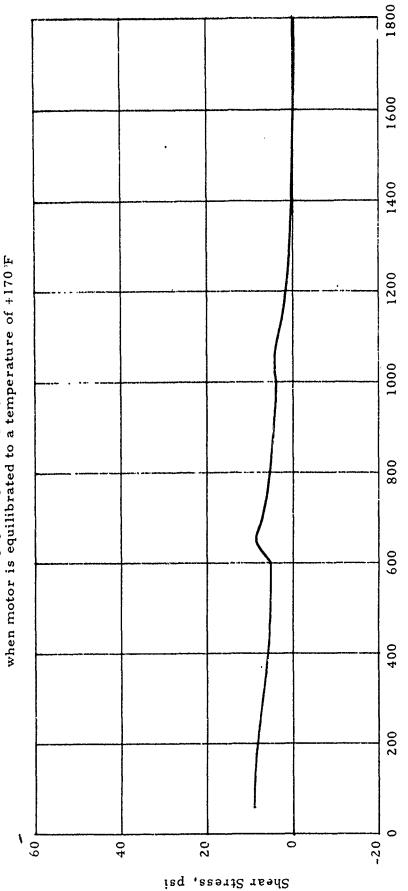
Motor Test

- S1-109

- -65°F

- Fwd

Gage Location



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-1)

Time, seconds

Motor - IM #1

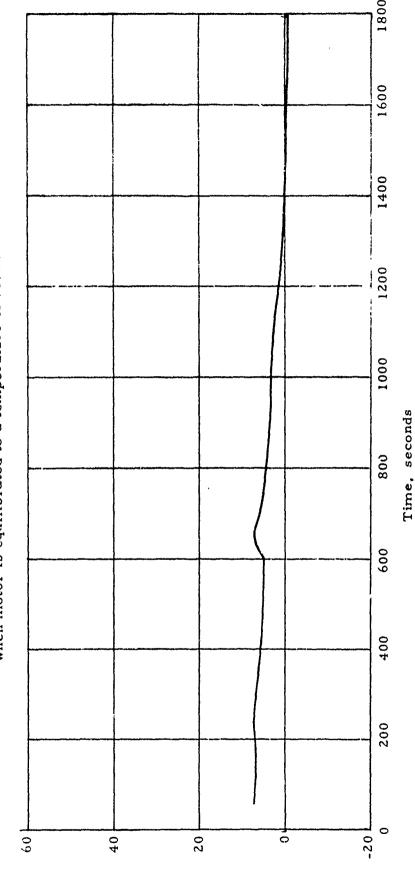
Test - A-2 (DMP-3)

Gage - S1-109

Location - Fwd

Tinitial --65·F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^\circ\mathrm{F}$



Head End Shear Stress Response to Aerohust Loads - Gage S1-109 (Test No. A-2)

Shear Stress, psi

Motor - IM # 1

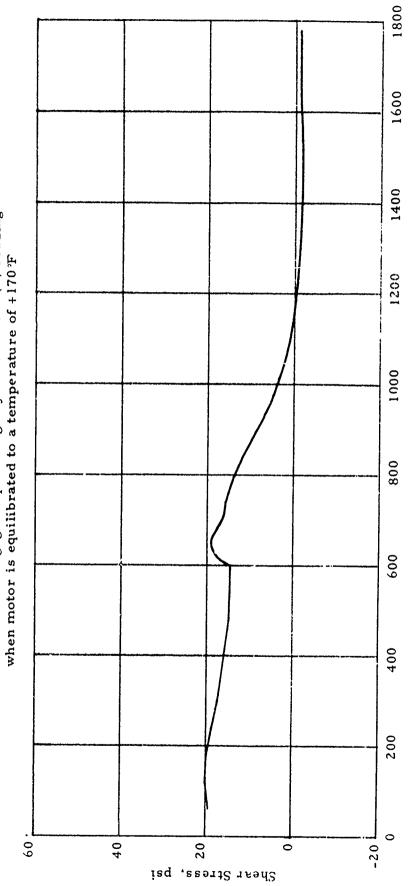
Test - A-3 (HSMH)

Gage - S1-109

Location - Fwd

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-3)

Time, seconds

which are a present the property of the proper

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Motor - IM #1

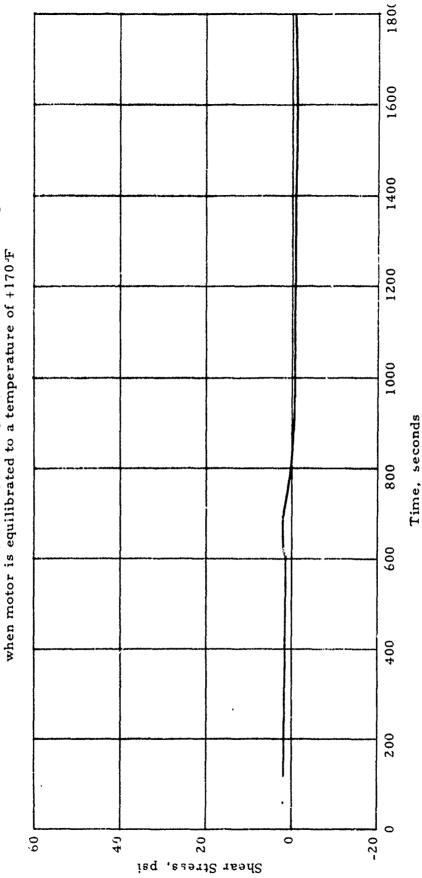
Test - A-4 (SFPI)

Gage - S1-109

Location - Fwd

Tinitial - 0°F

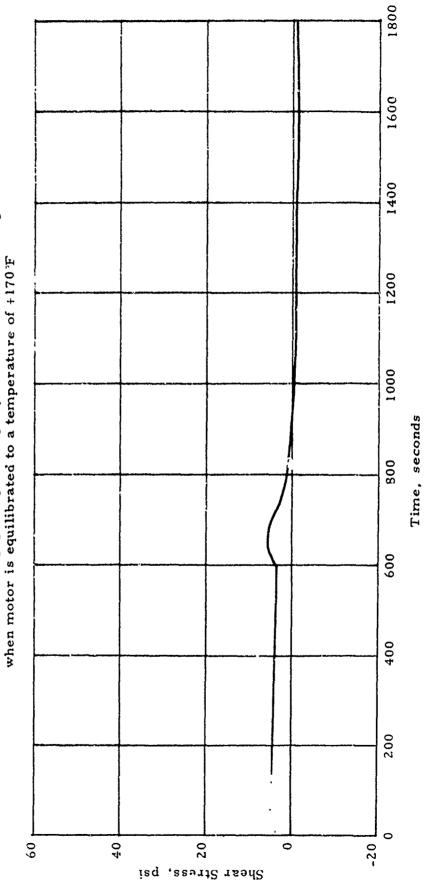
Data based on gage output being adjusted to zero (0) reading



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-4)

- A-5 (SFPI) . \$1-109 - IM #1 · 0 °F - Fwd Location T initial Motor Gage Test

Data based on gage output being adjusted to zero (0) reading

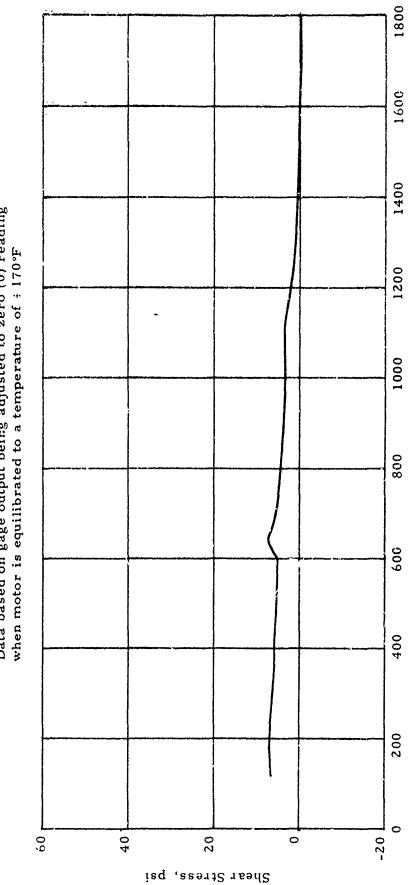


Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-5)

The second secon

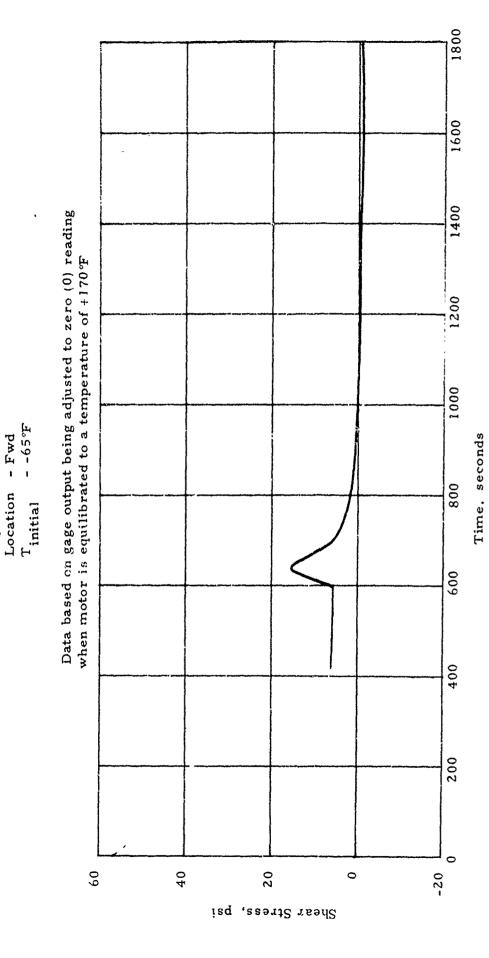
- A-6 (DMP-3) - S1-109 - IM #1 - -65°F - Fwd Location T initial Motor Gage Test

Data based on gage output being adjusted to zero (0) reading



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-6)

Time, seconds



- A-7 (SFPI)

- IM #1

Motor

- S1-109

Test Gage

Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-7)

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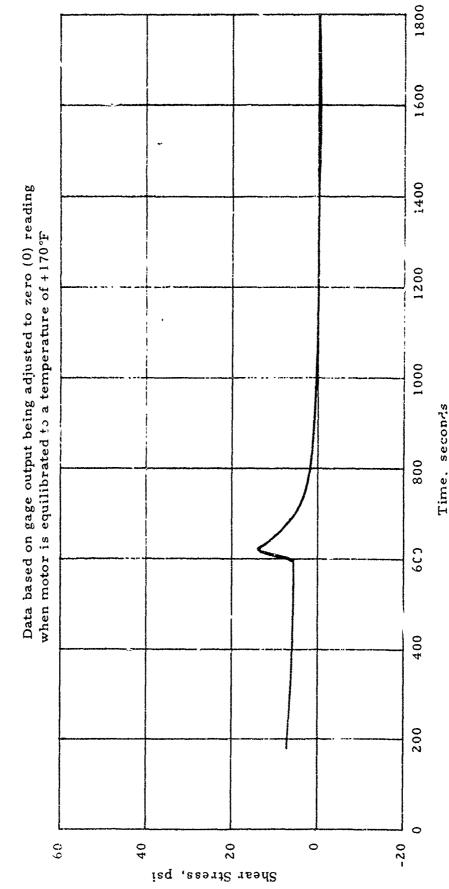
Motor - IM #1

Test - A-8 (SFPI)

Gage - S1-109

Location - F-vd

Tinitial - -6', F



Gage S1-109 (Test No. A-8) Head End Shear Stress Response to Aeroheat Loads

Motor - IM #1

Test - A-9 (SFPI)

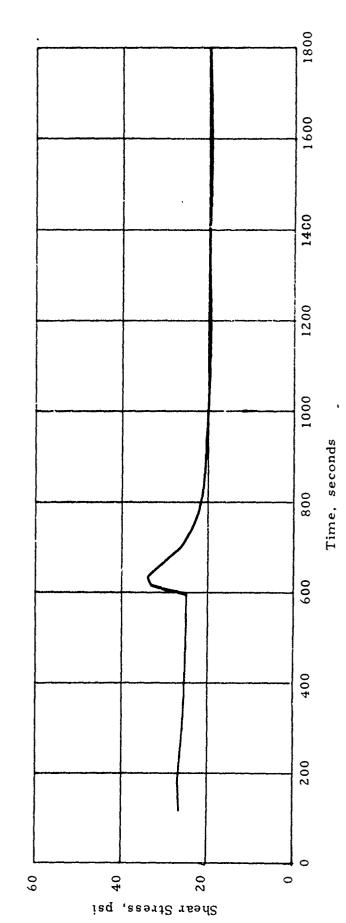
Gage - S1-109

Location - Fwd

Tinitial --65°F

The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm\,170\,{\rm T}$



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-9)

Motor - IM #1

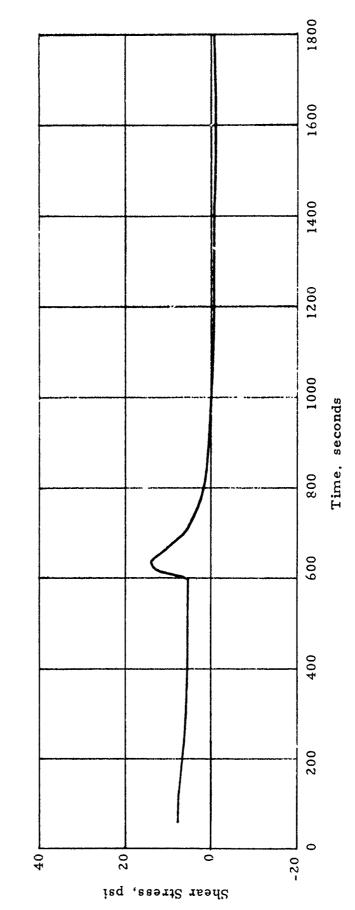
Test - A-10 (SFPI)

Gage - S1-109

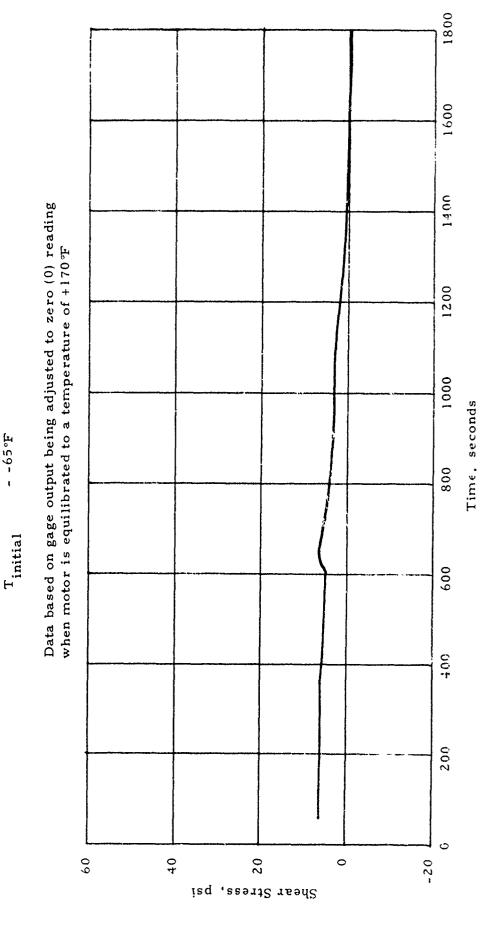
Location - Fwd

Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm\,170\,^\circ\!\mathrm{F}$



Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-10)



- A-12 (DMP-3)

- IM = 1

Motor

- 51-109

- Fwd

Location

Test Gage

Head End Shear Stress Response to Aeroheat Loads - Gage S1-109 (Test No. A-12)

to state and a state of the sta

Motor - IM #1

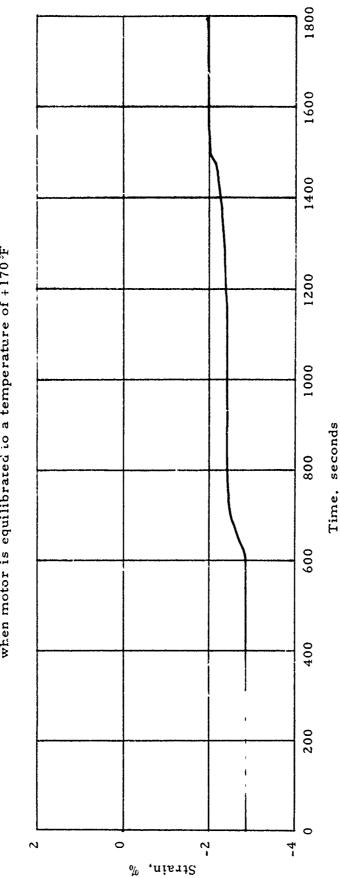
Test - A-7 (SFP1)

Gage - C1-12

Location - Fwd

Tinitial - -65°F

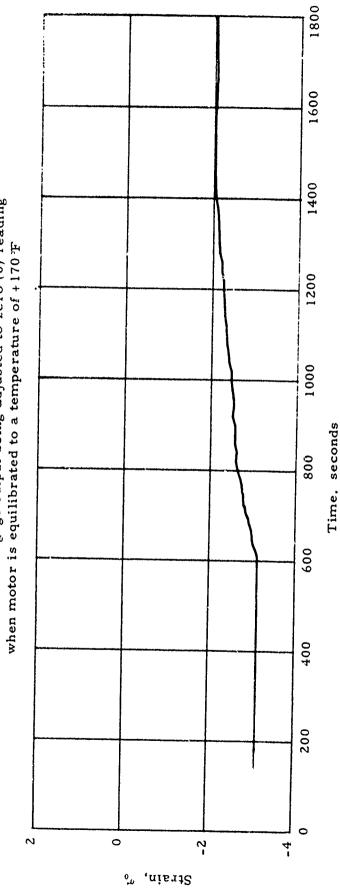
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,^{\circ}F$



Bore Strain Response to Aeroheat Loads - Gage C1-12 (Test - A-7)

- A-8 (SFPI) - IM :: 1 - C1-12 - -65 F - Fwd Location Tinitial Motor Gage Test

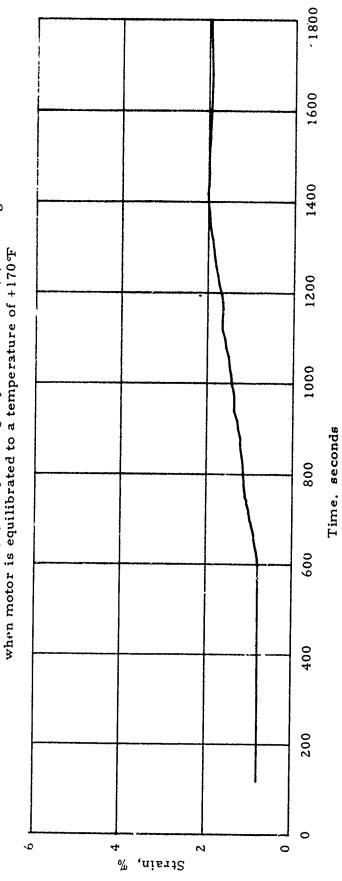
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,\mathrm{F}$



Bore Strain Response to Aeroheat Loads - Gage C1-12 (Test A-7)

- A-9 (SFPI) - C1-12 - Fwd - -65°F - IM #1 Gage Location T initia! Motor Test

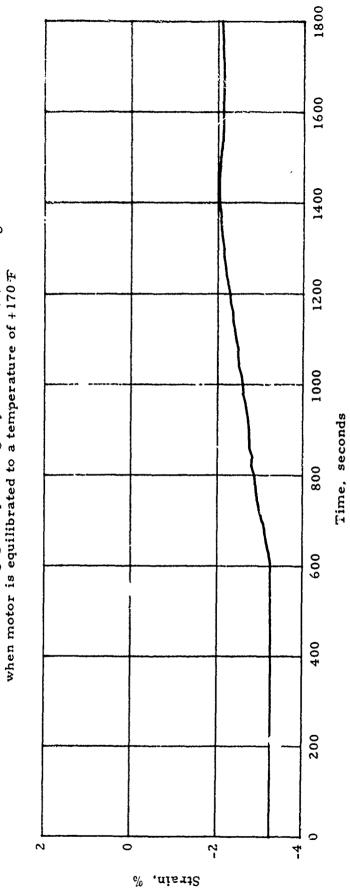
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm170\,\rm T$



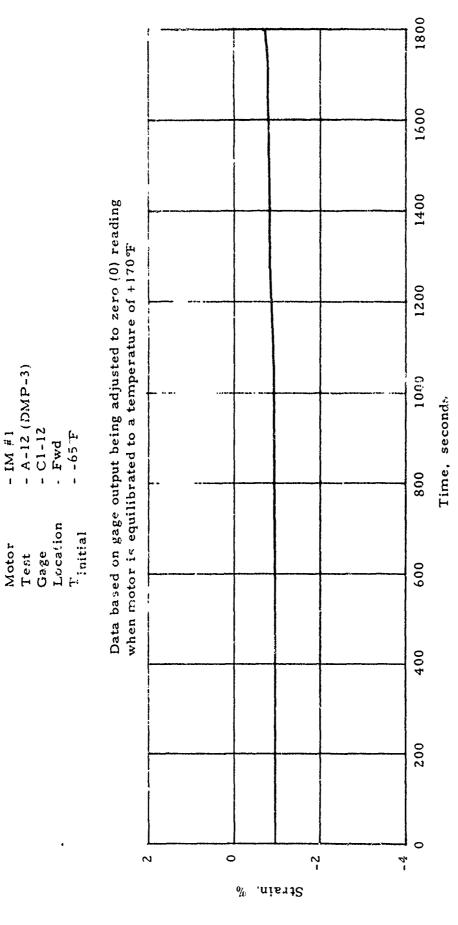
Bore Strain Response to Aeroheat Loads - Gage C1-12 (Test - A-9)

A-10 (SFPI) C1-12 IM #1 -65 E Fwd Location Tinitial Motor Test Gage

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 F



Bore Strain Response to Aeroheat Loads - Gage Cl-12 (Test - A-10)



Bore Strain Response to Aeroheat Loads - Gage C1-12 (Test A-12)

Motor - IM #1

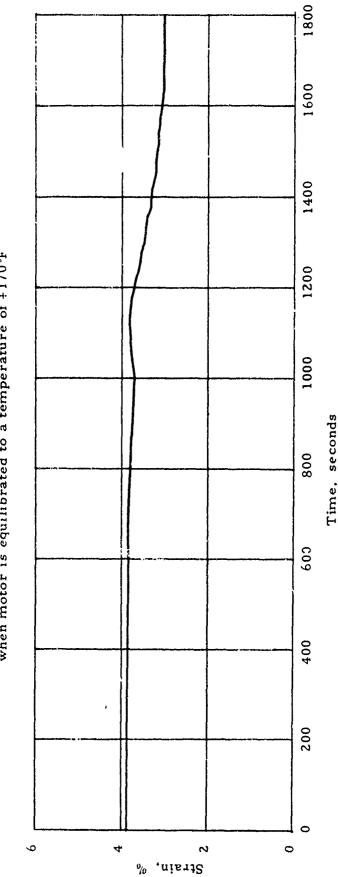
Test - A-1 (DMP-3)

Gage - C1-13

Location - Center

Tinitial - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm\,170\,^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-1)

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Motor - IM #1

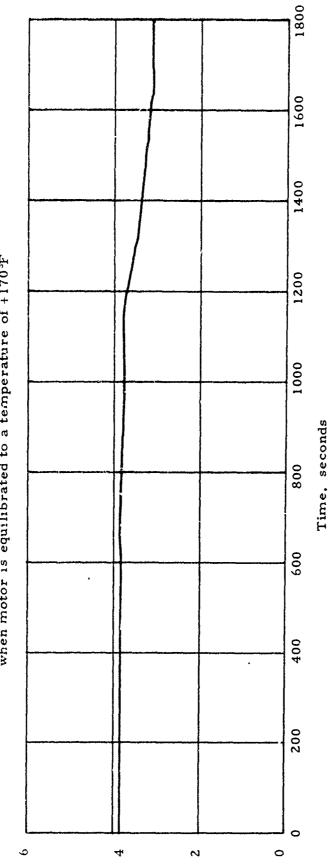
Test - A-2 (DMP-3)

Gage - C1-13

Location - Center

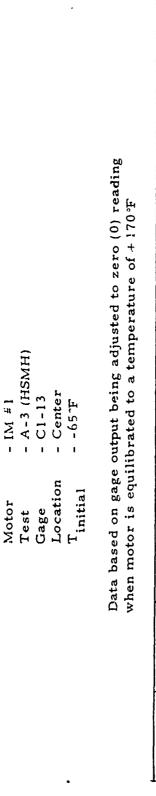
Tinitial --65 F

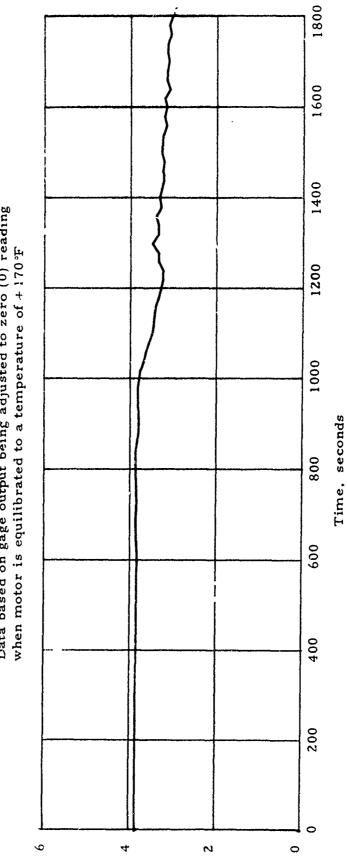
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-2)

Strain, %





Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-3)

Strain,

Motor - IM #1

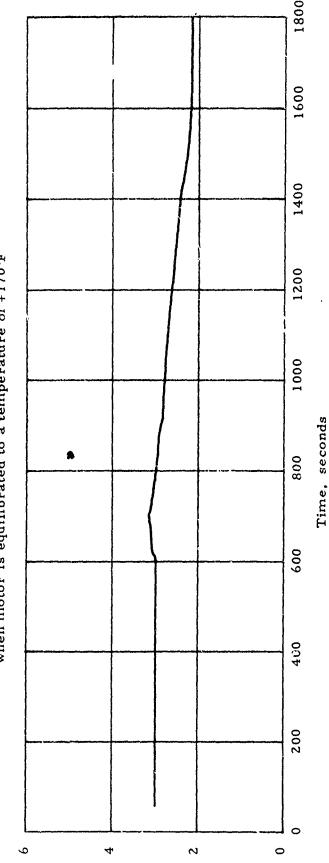
Test - A-4 (SFPI)

Gage - C1-13

Location · Center

Tinitial - -40 °F

Data based on gage output being adjusted to zero (0) reading when niotor is equilibrated to a temperature of $\pm 170\,^{\circ}\mathrm{F}$



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-4)

Strain,

%

Motor - IM #1

Test - A.5 (SFPI)

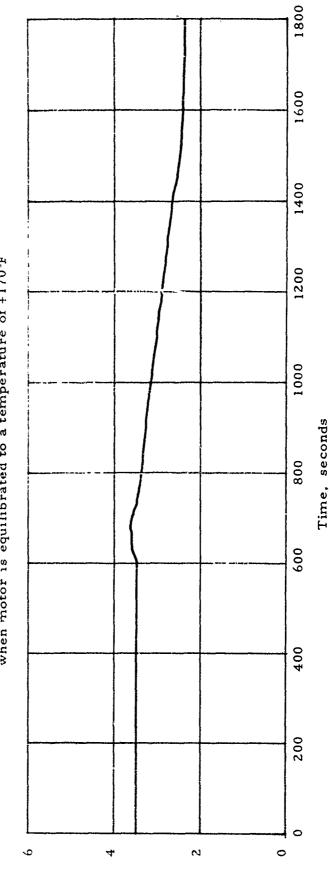
Gage - C1-13

Location - Center

Tinitial - 0 F

The state of the s

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}F$



Bore Strain Response to Aeroheat Loads - Gage Cl-13 (Test - A-5)

Strain,

 Motor
 - IM # 1

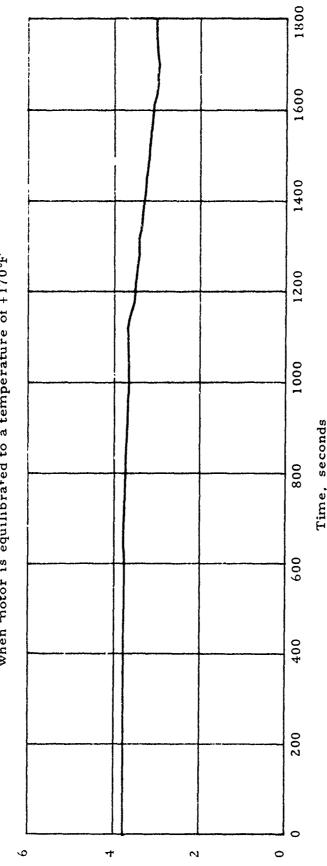
 Test
 - A-6 (DMP-3)

 Gage
 - C1-13

 Location
 - Center

 Tinitial
 - -65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170\,^{\circ}\mathrm{F}$



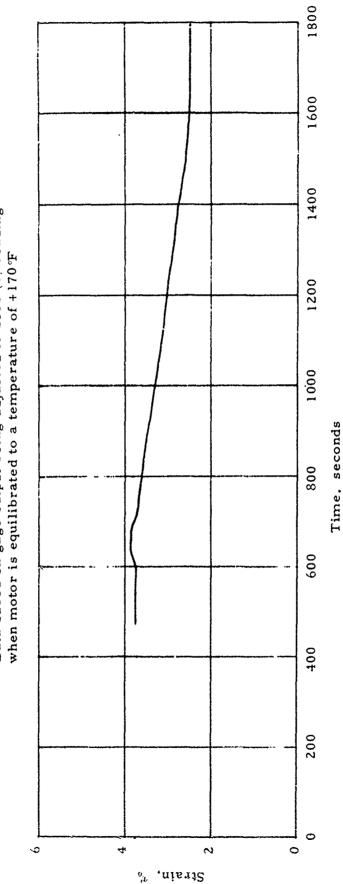
Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-6)

Strain,

%

- A-7 (SFPI) - Center - C1-13 - IM #1 - -65°F Location $T_{initial}$ Motor Gage Test

Data based on gage output being adjusted to zero (0) reading



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-7)

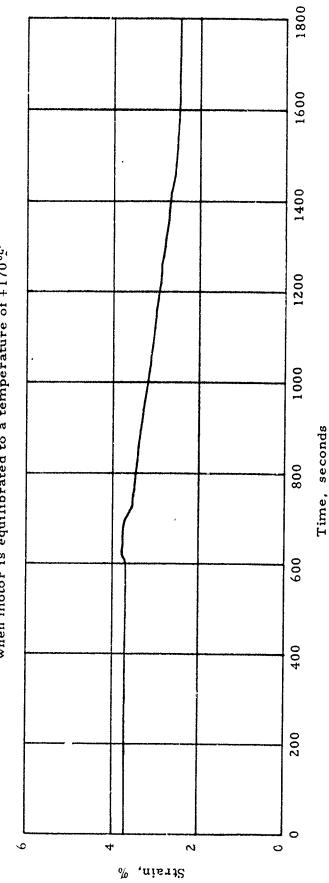
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And the second s

- A-8 (SFPI) - C1-13 - Center - IM #1 - -65°F Location $T_{initial}$ Motor Gage Test

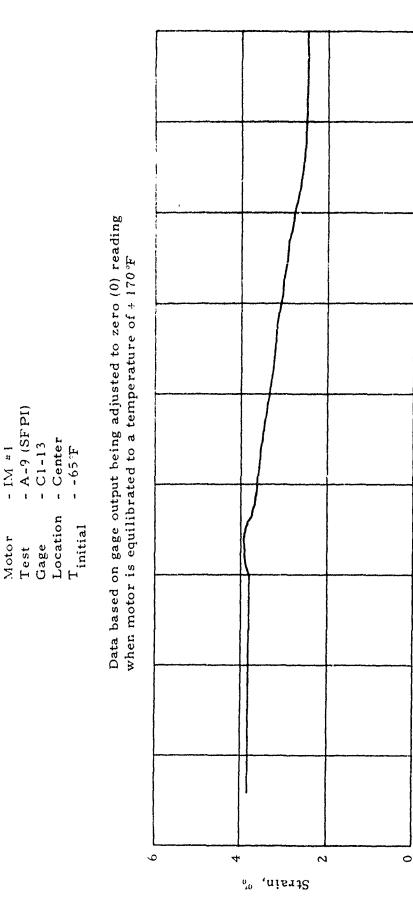
**

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $+170\,$ $^\circ$



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-8)

%



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-9)

Time, seconds

Motor - IM #1

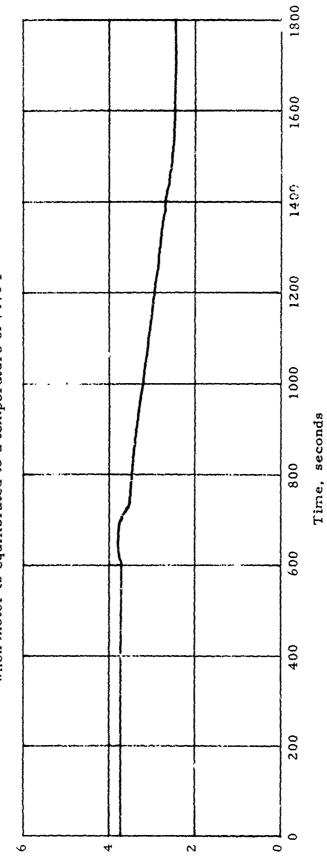
Test - A-10 (SFPI)

Gage - C1-13

Location - Center

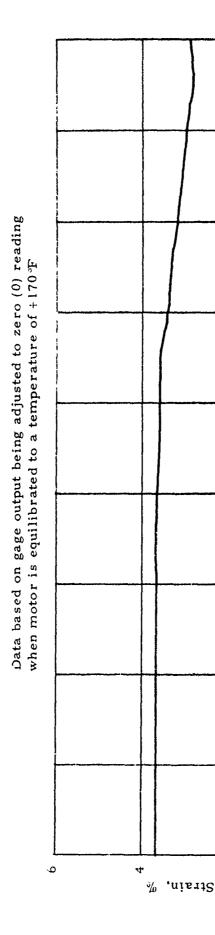
Tinitial --65°F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170^{\circ}$ F



Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-10)

Strain,



- A-12 (DMP-3)

Motor Test Gage

- C1-13

Location Tinitial

--65°F

Bore Strain Response to Aeroheat Loads - Gage C1-13 (Test - A-12)

1800

1600

1400

1200

1000

800

069

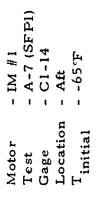
400

200

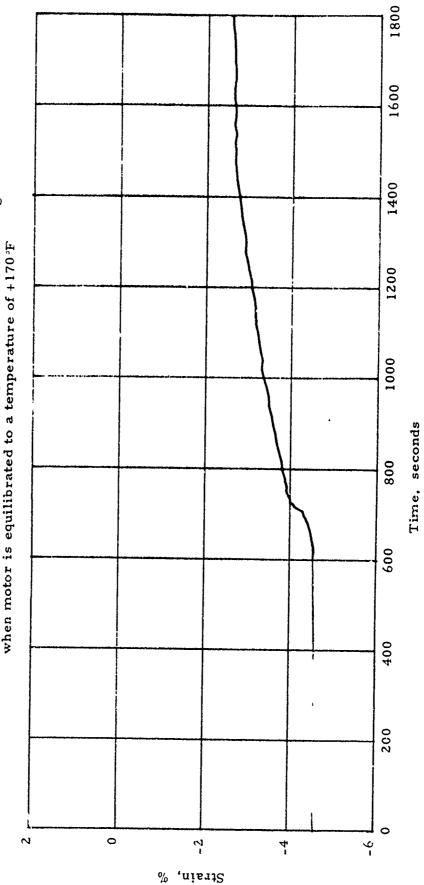
0

Time, seconds

N



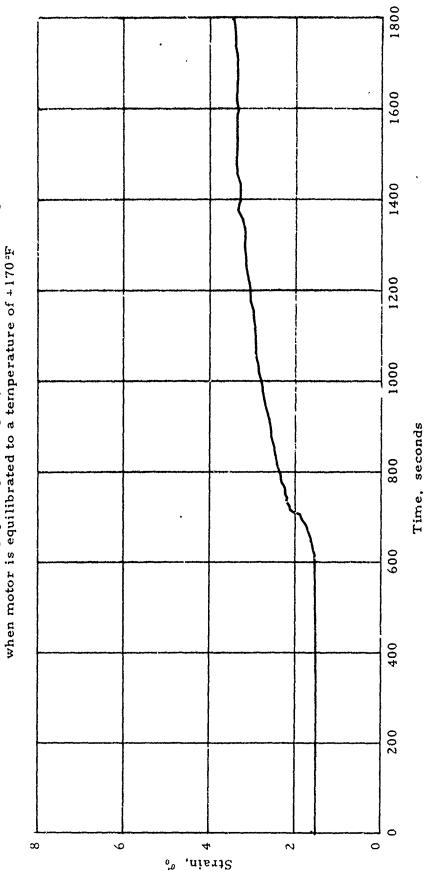
Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 °F



Bore Strain Response to Aeroheat Loads - Gage CI-14 (Test - A-7)

- A-8 (SFPI) - C1-14 - IM #1 - -65°F - Aft Location $T_{initial}$ Motor Gage Test

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of $\pm 170\,^\circ F$



Bore Strain Response to Aeroheat Loads - Gage C1-14 (Test A-8)

The state of the s

 Motor
 - IM # 1

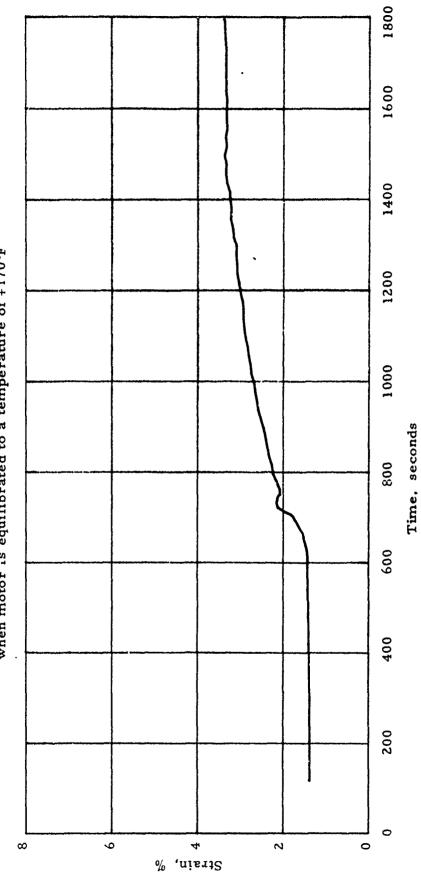
 Test
 - A-9 (SFPI)

 Gage
 - C1-14

 Location
 - Aft

 Tinitial
 - -65 F

Data based on gage output being adjusted to zero (0) reading when motor is equilibrated to a temperature of +170 F

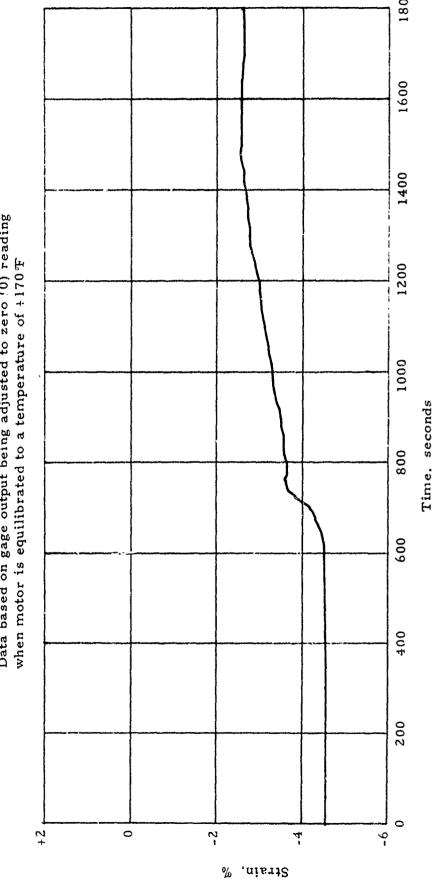


Bore Strain Response to Aeroheat Loads - Gage C1-14 (Test - A-9)

- A-10 (SFPI) - C1-14 - IM #1 - -65 F - Aft Location T initial Motor Gage Test

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Data based on gage output being adjusted to zero (0) reading



Bore Strain Response to Aeroheat Loads - Gage C1-14 (Test - A-10)

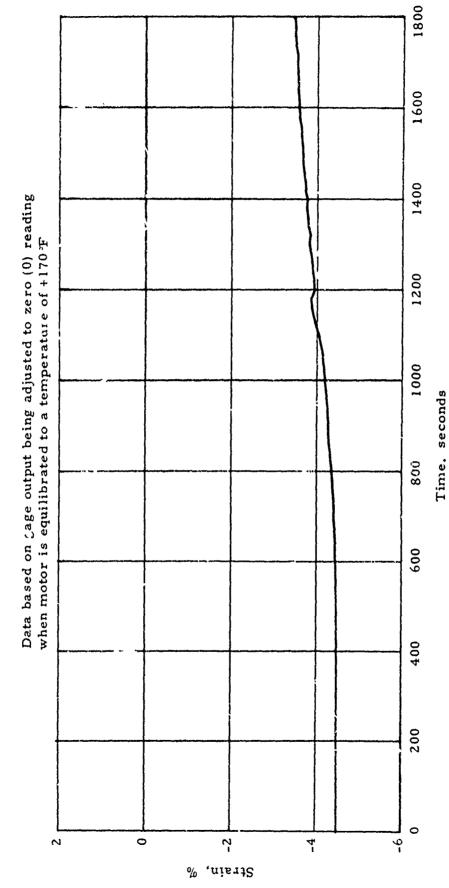
Motor - IM #1

Test - A-12 (DMP-3)

Gage - C1-14

Location - Aft

Tinitial --65 F



Bore Strain Response to Aercheat Loads - Gage Cl-14 (Test - A-12)

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